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Optimum Working Conditions for the Eye

C. E. Ferree, Ph.D., and G. Rand, Ph.D.

ACKNOWLEDGED authorities in their field, Drs. Ferree and Rand, summarizing the context of papers prepared on this subject over a period of twenty-five years, present a recapitulation of their most important and practically significant conclusions.

WE HAVE conducted experiments and research for more than twenty-five years on the best working conditions for the eye. Results of these researches have been printed in various papers, more than 75 articles in all. However, we have received so many requests for information on this subject that we have prepared the following brief note stating some of our most important and practically significant results and conclusions.

Working conditions in relation to the eye include both the work and its illumination.

The Illumination

With respect to the illumination of the work, we have found the best conditions to be given by daylight or artificial light closely approximating daylight in color and composition, and as closely as possible in diffuseness.

As to color, it should be noted that many of the so-called artificial daylights are of more harm than benefit to the eye. In the selection of an artificial daylight great care should be taken that the light obtained has a proportion of wave-lengths well balanced with respect to the welfare and comfort of the eye, such as is the case with the filtered light obtained with the two types of glass furnished by the Macbeth Daylighting Company—Daylight and Whiterlite. Not every blue glass can be used to advantage as a filter for Mazda light. On examination with the spectrophotometer

the blue bulb of commerce, for example, shows an excess of light in the green of the spectrum. Also, the glass used in making this bulb is not carefully standardized; that is, it is variable in its filtering properties. Tests made by us for ocular fatigue and discomfort with this lamp gave a poorer result than that of tests made with unfiltered Mazda light. Such tests, so far as we know, have not as yet been made with the various synthetic daylight.

Diffuseness of light is very important to satisfactory visibility. That is, if the light is not well diffused, all points in the object can not be adequately illuminated, and if they are not adequately illuminated they can not be clearly represented in the image that is formed on the retina.

The Intensity of Light

The optimum intensity of light varies widely for different people; also it varies with the kind of light used—the range of toleration for intensity of light being much greater for daylight than for artificial light. If too little light is used, low visibility results, and if too much is used, the excessively harmful effects of glare are experienced.

In our tests on 550 people ranging in age from 10 to 77 years, we have found that around 70 per cent preferred for reading 10-point type, and for similar kinds of work less than 15 foot-candles, and around 50 per cent, less than 12 foot-candles. Forty-eight per cent preferred between 7 and 12 foot-candles inclusive. There is a wide variation of preferred foot-candles for each decade age group and for the group as a whole. A few people prefer a very low intensity, five per cent preferring less than 4.9 foot-candles. In certain of these cases the preferred intensity was as low as 1.5 foot-candles and the upper limit of toleration for comfortable reading as low as 2 foot-candles. A few people prefer high values ranging from 20 to above 50 foot-candles, five per cent of the group preferring more than 36.5 foot-candles. The wide individual variation with respect to amount of light preferred for reading even within a single year of age is a most outstanding and important characteristic of the results obtained—more outstanding and important, for example, than any general trend or group variation.

The following additional points may be briefly noted: (1) From

10 to 20 years a tendency is shown to prefer more light than might be expected in young eyes—more, for example, than is preferred from 20 to 30 years. Above 35 years, particularly between 35 and 50, there is a general tendency to prefer more light for reading than below 35 years. A decided tendency to prefer more light is shown in the group of developing presbyopes (35 to 50 years). This is probably due to the fact that in this group the eyes are changing in their refractive condition more rapidly than at any other period of the working life, so rapidly that it is difficult to keep them continuously properly corrected; and a poorly corrected eye, because of the blurred image that is formed on the retina, requires more light for the discrimination of its detail than a properly corrected eye. Further, the increased amount of light narrows the pupil of the eye, which in turn helps to clear up the image. However, a surprisingly large number of the developing presbyopes preferred very small amounts of light. This is probably due to an undue prevalence of an irritable condition of the eyes caused by the poor refractive correction. Also during this period a great deal of strain is caused by the rapidly growing disturbance in the relationship between accommodation and convergence and by other changes and conditions due to the beginning of old age. Until a toleration or adjustment is acquired for these disturbances, as occurs in more established presbyopia, undue irritability is experienced. Strange as it may seem to some, the group above 50 years of age conforms most closely to the total group as to distribution of amount of light preferred for reading. However, it should be remembered that in this group the eye presumably has its refractive errors well corrected and has acquired an adjustment and toleration for the changes that have taken place during the development of presbyopia.

In connection with the old eye it is a point of interest, too, that while it needs more light as an aid to vision, it receives less benefit to vision through increase of intensity of light than the young or middle-aged eye. In explanation of this the following are some of the possible suggestions: (a) The old eye has a characteristically small and less mobile pupil than the young eye. It therefore does not get as much increase in focusing action through the contraction of the pupil caused by increase of intensity of light as does the

young eye. (b) The retina of the old eye has more lag or inertia in its increase in response to increase of intensity of light than that of the young eye; also its physiological limit of response and the point of diminishing returns are reached at a lower intensity of light. (c) The growing opacity of the media of the old eye causes more and more scatter of light, which interferes with the power to form clear images on the retina. This effect increases with increase of intensity of light. In the early stages of the development of a cataract, for example, it often becomes so extreme as to render the use of the higher intensities of light intolerable and blinding.

(2) There is a decided tendency for those having large pupils to prefer less light and for those having small pupils to prefer more light than the group as a whole, while the preference of those having pupils of medium size is about the same as for the group as a whole. The effect is, however, perhaps less striking than might be expected from the relative amounts of light collected in the image by pupils of different size. The compensating effect of the clearness of imaging given by a small pupil and the unclearness given by a large pupil must be remembered. An example of this is found in the very small number of those having large pupils who preferred less than five foot-candles as compared with those having pupils of medium size.

(3) Within narrow but significant limits, intensity of light sustains an inverse relationship to the strength of reading glass required in the correction of presbyopic eyes. There are two ways of aiding the presbyopic eye to see its object at the required near distance; namely, a correcting glass and intensity of light. The former of these is a major and the latter a minor or auxiliary aid. However, the best selection of either can not be made without reference to the other. The preferred procedure is the selection of the optimum intensity of light and strength of glass. This selection is easy to make when the examiner is provided with the customary trial lenses and a means of varying the intensity of light, such as our Variable Illuminator*; that is, the person examined is in no

* This instrument is described in "Lamp for the Determination and Measurement of the Preferred Intensity of Light for Reading and for Other Work," *Archives of Ophthalmology*, 1934, Vol. 12, pp. 45-59, and "Care and Examination of the Eye in Relation to Lighting," *ibid.*, 1937, Vol. 17, pp. 78-103. It may be obtained from the American Optical Company and E. B. Meyrowitz Surgical Instruments Co.

doubt when the most comfortable and satisfactory combination is attained. If for some reason the intensity of illumination so determined is not available to the person examined, then the selection of strength of glass should be made for the intensity or range of intensities he is compelled to use. Limiting conditions determining the selection of a combination are, on the one hand, the discomfort produced by too high an intensity of illumination and, on the other, the disadvantages of using a stronger correcting glass than is needed, namely, the greater amount of convergence required with the stronger glass, the less favorable relation between accommodation and convergence, and the undue limitation of the range of distance over which the work can be discriminated. It may be noted here too that in the early stages of presbyopia, when the refractive condition is changing rapidly, there is an advantage in using all the light that can be tolerated with comfort in that by so doing the correcting glasses will not have to be changed so frequently.

This study, our latest and one of our most important, was made with a strict observance of all the precautions to guard against possible sources of error that we have learned in more than twenty-five years of experimentation on the effects of lighting on the eye, and the results we believe can be fully trusted. We feel that it is fitting to say this because of the very great interest there is at present in the subject of intensity of light and how best to adapt it to the use of the eye and because space can not be taken here for any description or discussion of our method of working.

Glare

One of the most important factors in lighting is glare. Glare may be from either the work or the source of light. Glare from the work comes at much lower intensities for Mazda light than for daylight. This is due partly to the color of the light and partly to the difference in diffuseness between daylight and the illumination given by artificial lighting devices. Mazda light is yellowish. Yellow light becomes glaring at lower intensities than white light. Higher susceptibility to glare is one of the ways in which the eye shows its intolerance of colored light. Mazda light is poorly diffused as compared with daylight. In light not well diffused the presence of the unscattered beams of light tend unduly to produce glare be-

cause of specular reflection, the tendency taking the form of shine when the specular reflection is even and of sparkle points when it is uneven. Direction of light also is an important factor in glare from the work. The light should be so directed on the work, particularly if it is not well diffused, that none of the light specularly reflected enters the eye. Of the three possible ways of reducing glare from the work—direction of light, diffuseness of light, and the attempt to eliminate specular reflection by polarization (Polaroid glass)—the proper control of direction of light is much the most effective, the most feasible and the least expensive. Glare from the source of light should of course in all cases be eliminated. This can be easily and effectively done by incorporating in the lighting fixture properly constructed shields or glare baffles. These shields or glare baffles are sometimes called louvers. This control can of course best be utilized in local lighting. Diffuseness of light has most to be depended on in general lighting.

Glare from the work is of two kinds, simple and veiling. Simple glare alone will be considered here. Simple glare is a too high brightness due to excessive stimulation of the sensorium by light. When reading from a printed page, it may be recognized as beginning at the intensity at which the brightness of the page becomes uncomfortable. In the experiments noted above on intensity of light this point was determined as well as the preferred amount of light and the lower limit of intensity for comfortable reading. With respect to these determinations there are, as in case of the preferred amount, two points of major interest: the amount of light at which discomfort begins and the wide range of individual differences in this amount, which differences may be taken, roughly at least, as measures of differences in susceptibility to glare. Some indication on both these points is given in the following brief statement of results. A few people have a very low upper limit of intensity for comfortable reading, 2 per cent having less than 5 foot-candles and 13 per cent less than 10 foot-candles; 47 per cent have an upper limit between 10 and 20 foot-candles and 14 per cent more than 40 foot-candles. The concentration of cases between 10 and 20 foot-candles is most pronounced for the 20 to 30 year group (66 per cent) and least for the 40 to 50 year group (31 per cent). From these results it might be considered that those who have an upper

limit of less than 10 foot-candles are more than usually susceptible to glare, while those who have an upper limit of more than 40 foot-candles are less than usually susceptible to glare.

Evenness of Illumination

Evenness of illumination as a factor has not the importance that was once ascribed to it. Within the limits that are apt to occur in a modern lighting situation its importance is not significant. So long as high and glaring brightnesses are eliminated from all parts of the work and from the field of view, and so long as there is enough light on all parts of the work and in the field of view, considerable differences in the illumination may be present without harmful effects on the eye.* Indeed, in the illumination of a room in which a number of people are working, unevenness of illumination is often of advantage inasmuch as it affords an opportunity for grouping or locating the workers with respect to their need and tolerance of intensity of light.

Type and Paper, Color of Ink and Paper, etc.

With respect to the surfacing of the written or printed page, the best results can be obtained with a mat or flat ink on mat paper. This again is a question of specular reflection. Light specularly reflected from an object is not focused into an image on the retina. It is represented merely by a spot of unfocused light. If focused, it would form an image of the source of light, not of the reflecting object. However, in looking at an object we focus for it, not for the source of light. Light diffusely reflected, since it begins its spread at the reflecting surface, alone forms an image of that surface on the retina. We thus see objects only by diffusely reflected light. The light specularly reflected, since it forms an overlay of unfocused light on the image, blurs that image and is, therefore, not an aid but a hindrance to vision.

With respect to color of ink and paper we have found: (1) The best results are given by black ink, and any color as background is inferior to white for the discrimination of details in black. There

* This has been shown in several papers but more particularly in "Some Experiments on the Eye with Pendant Opaque Reflectors Differing in Lining, Dimensions and Design," *Transactions of the Illuminating Engineering Society*, 1917, Vol. 12, pp. 464-487.

is a greater sensation difference between black on white than black on any of the colors and, therefore, greater visibility. This is so plain as to be readily apparent to anyone who makes the comparison on the printed or written page. Also black on white is very comfortable when the paper is free from gloss and the ink as nearly free from gloss as possible. Any feeling against this combination must have arisen through the use of glossy paper or bad lighting conditions; that is, a too high intensity of light or conditions that produce or accentuate specular reflection and glare. Further, as a practical evidence, the attempts that have been made to print newspapers, magazines and books on colored paper have met with a great deal of complaint from the readers. The more persistent use of faintly tinted papers is probably due to the difficulty in producing a satisfactorily mat white paper.

(2) Saturated colors as background for writing or printing in black are inferior to unsaturated colors; that is, the more color there is in the paper the worse is its effect on the welfare and comfort of the eye. There are two reasons for this—the effect on visibility and the effect of the color itself.

(3) The darker shades of color are inferior to the lighter tints.

(4) Of the colors, when all are equalized in saturation and brightness, yellow gives the best results. Next in order of merit is yellow tending towards orange-yellow. However, as already stated, all colors are inferior to white as a background for the discrimination of details in black.

(5) Any toning of the paper towards green is unfavorable in that it increases the tendency to ocular fatigue and discomfort, in spite of the common belief that green is restful to the eye. This belief has no doubt been based on the feeling of relief which comes with viewing distant woods and fields. Here the conditions are not a green light or a green background on which to view details, but the far seeing of objects of low brightness, both of which conditions are restful and comforting to the eye.*

So-called "white" papers may tend almost imperceptibly towards blue or yellow. For use under Mazda light it is sometimes possible in such cases to select a bluish white that will give a better

* The above conclusions refer, of course, to the use of ink and paper under colorless or approximately colorless light.

result than the yellowish white; that is, when the tendency towards blue is just enough to neutralize the excess of yellow in the light. Where scientific tests are not possible, it is a fairly safe practical guide, perhaps, to select the paper that looks the whitest under the light that is to be used.

In the selection of paper, besides color, the following additional factors are of course to be considered: reflection factor, gloss, hardness, and opacity. In the printing of newspapers, telephone directories, catalogues and large books of various kinds, trouble often arises from the use of paper that is too thin and not sufficiently hard and opaque. Hardness, for example, is needed to take a clear impression of the ink, and opacity, to give a good background and to prevent the confusion, so to speak, of seeing through the paper, seeing the print on the other side, etc. Obviously good visibility can not be had under such conditions.

The above conclusions on color and paper are based on tests of visual acuity, speed of visual discrimination, power to sustain clear seeing, and tendency to produce ocular fatigue and discomfort. In addition we have used an instrument devised by us, called a Visibility Comparator. This instrument enables direct numerical comparisons to be made of the discriminability or visibility of printed or typewritten material on different samples of paper, and of different colored illuminations on a given sample of paper.

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Incidence and Distribution of Trachoma in the United States*

Harry S. Gradle, M.D.

PRESENTS a racial and geographical distribution of trachoma. Dr. Gradle estimates a total trachomatous population in the United States of around 60,000, of whom 25,000 are American Indians.

THE trachoma that is found in the United States is distributed roughly as follows:

- (a) Among the American-born Caucasians in endemic form.
- (b) Among the foreign-born immigrants.
- (c) Among the Asiatics and Mexicans who have entered the United States illegally.
- (d) In sporadic form among city dwellers without known source of contact.
- (e) Among the American Indians.

In the various states of the Union, trachoma is not uniformly reportable, and consequently there are no adequate statistics as to the total number of people infected. Herewith is a table compiled by the U. S. Public Health Service, representing the number of cases of trachoma reported in 1937. What stage of the disease is represented here is not known, nor is it known whether or not these are cases seen for the first time. However, analogy may be used to gain a rough idea of totals. In the trachoma clinics of southern Illinois, 3,350 cases of trachoma have been discovered within the past five years. Of that number, 389 were seen for the first time during 1937; in other words, the new cases of that year represent eight and six-tenths per cent (roughly ten per cent) of the total number in that district. Arguing on that basis, the number

* Presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, October 28, 1939.

of cases reported to the United States Public Health Service in 1937 (2,324) represents ten per cent of the total cases of trachoma in the United States, which would give 23,250 cases, apart from the Indians. But in some of the states—even in the hotbed district—trachoma is not reportable, and consequently this figure is at least 10,000 under the actual incidence. So we may assume that there is a minimum of 33,500 cases of trachoma in the non-Indian population.



FIG. 1.—GEOGRAPHIC DISTRIBUTION OF TRACHOMA CASES REPORTED IN 1937.

Based on the 1928 census, which reported 64,000 blind individuals in the United States, Best assigns trachoma as the cause of blindness in two and six-tenths per cent; that is, 1,690 cases. On that basis, if ten per cent of the cases of trachoma develop blindness, it would mean 16,900 cases of trachoma in the United States. But it is a well-known fact that the census was far from complete. And a rather careful estimate seems to show that there are about twice the number of blind as reported there. Consequently, that would bring the number of blind from trachoma up to 3,380. With that number assumed as ten per cent of the total, the non-Indian trachomatous population of the United States would number 33,800.

TABLE I.—NEW CASES OF TRACHOMA REPORTED TO THE PUBLIC HEALTH SERVICE IN 1937 (EXCLUSIVE OF INDIANS)

<i>State</i>	<i>Cases</i>
Massachusetts.....	21
Connecticut.....	4
New Jersey.....	7
Pennsylvania.....	12
Ohio.....	435
Illinois.....	502
Michigan.....	4
Wisconsin.....	6
Minnesota.....	10
Iowa.....	22
Missouri.....	476
South Dakota.....	2
Kansas.....	1
Maryland.....	2
Virginia.....	3
Georgia.....	2
Florida.....	1
Tennessee.....	118
Alabama.....	11
Mississippi.....	50
Arkansas.....	38
Louisiana.....	8
Oklahoma.....	106
Montana.....	0
Idaho.....	0
Colorado.....	1
New Mexico.....	5
Arizona.....	123
Washington.....	0
Oregon.....	4
California.....	243
North Dakota.....	27
Kentucky.....	68
West Virginia.....	12
Total.....	2,324

Over a six-months' period, the new cases in the trachoma clinics of southern Illinois were divided as follows:

Stage I.....	12.9 per cent
Stage II.....	22.8 per cent
Stage III.....	27.2 per cent
Stage IV.....	37.1 per cent

Using the same analogy, the trachoma cases in the United States, apart from the Indians, would be divided approximately as follows:

Stage I.....	4,322 cases
Stage II.....	7,538 cases
Stage III.....	9,012 cases
Stage IV.....	12,630 cases
	<hr/> 33,502 cases

An effort was made to show the geographical distribution of the cases of trachoma reported in 1937 by counties. The accompanying spot map is self-explanatory, each dot representing a known case of trachoma, evidently seen for the first time in 1937. Apart from the Indian Service, there is but little organized effort in the United States to locate and treat cases of trachoma. In Missouri, the United States Public Health Service has performed a good job in the survey and treatment of trachoma sufferers. In Illinois, trachoma is confined to the southernmost 17 counties where, for the past five years, we have been operating five full-time out-patient clinics, combined with extensive social service and field scouting. As a result, there are undoubtedly less than a few hundred cases as yet undiscovered. Among the remainder of the states the diagnostic survey work is very haphazard, and consequently the figures here presented cannot be accepted as accurate.

Trachoma occurs endemically in West Virginia, parts of Ohio and Indiana, Kentucky, and the adjacent parts of the Carolinas and Tennessee, Missouri, Oklahoma, and southern Illinois. Here the disease is found among native-born Americans, descended from the white settlers who wended their way westward around 1800. Evidently the virus was scattered during that migration. As these people seldom wandered far from home, the disease must have been spread slowly by contact until the infected areas gradually assumed the club shape shown in the accompanying map. Until a more accurate survey has been made, it is impossible to estimate the total number of infected individuals in this zone.

Foreign-born immigrants were formerly moderately infected with trachoma, particularly those from Russia, Poland, and the Balkans. But as immigration has lessened, and medical inspection has become more rigorous, only a few Trachoma IV cases now enter

the country. Of course, exacerbations occur in the older cases, but they no longer form a focus of infection.

Despite most rigorous precautions, there is a constant trickle of Asiatics and Mexicans filtering across the far-flung borders of the United States. Many of them have Trachoma II or III, and are gradually drifting into the clinics. The menace of infection from these aliens is not great but it constitutes a definite danger, especially along the southwest borders.

Sporadic cases, particularly in the urban population, appear from time to time. Despite all efforts, it is usually impossible to trace the source of infection. These are similar to the instance of an acute trachoma in a London physician, mentioned by MacCallan. Interestingly enough, a fairly high proportion of such cases are unilateral and are apt to remain so. Prompt treatment and proper advice eliminate the sporadic cases as a focus of further infections.

Trachoma among the American Indians presents a different problem. Under the Department of the Interior, there have been established 228 separate reservations for Indians scattered around the United States. The population of the reservations varies from a minimum of 30 to a maximum of 22,250, with a total Indian census of 342,500. The incidence of trachoma varies with each individual reservation, from nothing among the Seminoles to 35 per cent among the Navajos. Curiously enough, adjacent reservations will show widely varying percentages that are entirely unaccountable.

TABLE II.—INCIDENCE OF TRACHOMA AMONG INDIANS BY STATE

	<i>Per Cent</i>	<i>Number</i>
Oklahoma and Kansas.....	Less than 2 per cent	1,975
North Carolina.....	Less than 2 per cent	67
Florida.....	0 per cent	0
Minnesota and Wisconsin.....	4 per cent	1,135
North and South Dakota.....	8 per cent	3,139
Wyoming.....	18 per cent	419
Montana.....	22 per cent	3,595
Oregon and Washington.....	4 per cent	739
Idaho.....	10 per cent	42
California.....	Less than 2 per cent	472
Nevada.....	8 per cent	429
Utah and Colorado.....	12 per cent	364
Arizona.....	18 per cent	8,325
New Mexico.....	12 per cent	4,329
Total.....		25,030

In view of the large number of reservations, it was found advisable to estimate the incidence of trachoma among the Indians on the basis of state populations rather than the individual reservation.

Although many of the Indian tribes are essentially nomadic and wander over vast territories, the excellent work of the Indian Medical Service has resulted in a fairly accurate survey of the incidence of trachoma. The very nomadic nature, together with the characteristic Indian stoicism, makes treatment and eradication an entirely different matter. The majority of the Indians—particularly among the heavily infected tribes—remain for the most part on the reservations. Along the fringes—particularly along the bordering railroads—a low amount of infection in the Caucasian population is to be found. In the southwest, the illegal Mexican immigrant is believed to be more at fault as a carrier than are the Indians.

To sum up the distribution of trachoma in the United States, it may be assumed that there is roughly a minimum of 35,000 cases among the non-Indian peoples, and 25,000 among the Indians. Of the former, approximately 70 per cent are to be found along the old trail made by the early settlers from the Atlantic seaboard to the junction of the Ohio and Mississippi Rivers. The remainder of the cases are scattered indiscriminately around the country. Among the Indians, 60 per cent of the incidence is in the tribes of the southwest. The tribes in the middle west and along the Mississippi River valley are moderately infected (16 per cent), and the rest occurs irregularly in the smaller reservations.

The Ophthalmologist and the Sight-Saving Class Teacher in Conservation of Vision

Edmond L. Cooper, M.D.

EMPHASIZES the relationship of the ophthalmologist and the sight-saving class teacher in handling the problem of the partially-sighted child.

THE skilled services and scientific knowledge of the ophthalmologist must be the foundation on which any program for prevention of blindness is based. However, he cannot and should not stand alone. Outside the medical profession there is an increasing awareness of the problem of safeguarding eyesight. The tragedy of blindness—partial or complete—is no longer solely a personal problem, involving only the patient and his physician. Educators, public health officials, nurses, industrialists, sanitary and illuminating engineers, and social workers all have a rightful place in the attack on this enemy.

It is the relationship, particularly between the ophthalmologist and the sight-saving class teacher, which I wish to emphasize. This relationship should be a close one. Like other ophthalmologists, I like to feel, when I have a case of poor vision in a child, that I will have the closest co-operation from the teacher of that child. I think I should rightfully expect that the teacher will show as great interest in the child's visual welfare, and as close co-operation with me, as is expected of the parents of the child. In return for this co-operation, the teacher should and may expect that the ophthalmologist will provide her with the data necessary to aid her in her work.

Besides co-operating closely with the ophthalmologist, the sight-saving class teacher can make noteworthy contributions to the prevention of blindness—first, by educating the public (by this I mean

chiefly the parents of her pupils) to the importance of thorough and periodic eye examinations; and, second, by referring suspected cases for examination.

Co-operation Between School and Ophthalmologist

Close co-operation between ophthalmologist and teacher is sometimes considerably handicapped by the existence of an even closer relationship between the ophthalmologist and his patient. This patient-physician relationship is sacred to us and, though it sometimes stands in the way of efficient work by the teacher, I think it is justifiable. In these cases the utmost tact must be exercised by the teacher if she is going to accomplish all she would like to do.

By way of illustration we may take the imaginary case of a young girl who is discovered by her school nurse to have poor vision and red and sore eyes. The girl is referred to her family doctor or directly to an ophthalmologist who, in turn, makes a diagnosis of syphilitic interstitial keratitis. He also obtains a positive blood test, let us say, in the mother and in one of the other children in the family. Under proper treatment the child's condition is cured, leaving some corneal scars which reduce the vision in the better eye to 20/70. The child is obviously a candidate for a sight-saving class, and that recommendation is made by the ophthalmologist to the parents. For some reason—perhaps a dislike of having the child in a class distinct from that which other children attend, or perhaps a reluctance to have the incidence of syphilis in the family become known—the parents do nothing about getting the child into a sight-saving class. The school nurse, however, sends to the ophthalmologist a form to be filled out, showing the child's vision with and without correction, and the diagnosis—together with the recommendation of the ophthalmologist. These forms are, of course, necessary. The data obtained from them permit the teacher to classify the child and to work in closer harmony with the ophthalmologist. However, the information requested is, in this case, of a nature which cannot be divulged to the teacher without the consent of the parents. Usually this consent is easily obtained but occasionally the nature of the case renders it more difficult, and such cases require of both teacher and ophthalmologist the utmost discretion.

The teacher should never lose sight of the fact that the personal relationship between doctor and patient has priority over the relationship between herself and the doctor. Of course, all this is true only when the patient is responsible for the bill. In those cases in which the school authorities, for some reason or other, are financially responsible, they are entitled without question to such information. No one will deny that information regarding cases referred by the school social service, and paid for by them, can be divulged.

One of the ways, then, in which a teacher may contribute to prevention of visual deficiency is by education of parents to the importance of examinations and by referring suspected cases to the physician for diagnosis. I think that, outside of actual teaching, this is one of the most important services that a teacher can perform.

There are many parents who, either through ignorance or because of financial conditions or other interests, do not give their children the proper chance. I have had parents bring their children to me and say that the nurse had been requesting them for three or four years to have their child examined; they are just getting around to it. These cases are, in any event, bad enough, but when the examination reveals a progressive myopia, and the realization comes home that three or four years have been wasted, it is tragic indeed. The teacher is handicapped here, of course, but she can do much to prevent such occurrences. A few minutes of personal conversation with a parent are much better than a dozen notes sent home with the child.

The teacher can refer suspected cases for examination, and she should always do so. She should never, under any circumstances, refer to any special ophthalmologist. The patient is entitled to his own choice of physician, and should be allowed to make that choice. Only when the parents of a child state definitely that they know of no one to whom they could go, may the teacher suggest someone, and then it is always wise to suggest two or three names and let the parents make a choice. The teacher always has pupils who have previously been under the care of an ophthalmologist, and she should make every effort to see that the parents do not change doctors without cause. Undoubtedly the poorest results are often seen in patients who persist in running from one doctor to another.

In handling pupils of sight-saving classes, I should emphasize the need of understanding each case and of treating him as an individual, rather than as a member of a handicapped or unsuccessful group. The teacher should try in each case to make her methods suit the patient, rather than try to use one method with all patients.

Necessity for Uniform Recording of Eye Conditions

In order to do her work properly, the teacher must have the information necessary to classify the children. She wants to know what error the child has, and whether or not it will advance. She wants to know the vision both with and without correction; and she wants to know the diagnosis. This information is best obtained by use of a specific form to be filled out for each case. Without such a form the information given the teacher by the ophthalmologist might be incomplete or even so thorough as to be unwieldy. The form used in Detroit requires the ophthalmologist to state the child's vision without correction; the prescription for glasses; the vision with correction; the diagnosis; and the recommendation of the ophthalmologist as to the need for sight-saving class instruction. There is also space for any further remarks the ophthalmologist may wish to make. The form is completed by the name and age of the child, and the date of examination. I venture to say that even these forms are not entirely satisfactory at times because of lack of agreement among ophthalmologists as to how vision shall be recorded, and how diagnosis shall be stated.

The Committee on Statistics of the Blind has long advocated a standard scale for recording vision, by means of which it would be possible for all eye clinics and all ophthalmologists to classify their patients uniformly. For example, some ophthalmologists may record vision as 20/70 or 20/100, while others may use the metric system, recording 6/15 or 6/30. Some record vision of less than 20/200 simply as "less than 20/200." Others more accurately state that the vision is limited to hand movement or to counting fingers, or as "5/200." It can be seen from this that a standard scale is important.

Patients are sometimes hard to classify from these records because of faulty recording of diagnosis. What the teacher is interested in is the cause of the faulty vision in a given case. An at-

tempt should be made to standardize procedures for recording the diagnosis, which may be topographical or etiological. For instance, in a case of detachment of the retina one ophthalmologist may state the cause of blindness to be "ablatio retinae"; another, "detached retina"; and still another, "a blow on the head."

Teacher's Reliance on Ophthalmologist

I should like to spend a few moments discussing what seem to me to be several pertinent points regarding the management of the sight-saving class child by the teacher. In the first place, the teacher should always go to the source of medical care for information regarding the child. The ophthalmologist is the only person qualified to provide her with the necessary data. She should be very careful not to be influenced by the opinions of well-meaning friends. So often a friend will make to the parent of a sight-saving class child a remark, such as, "You know, I think Bobby has a cataract. My cousin's little girl had eyes just like Bobby's, and she had a cataract." The teacher should pay attention to this only to the extent of explaining to the parent that the doctor's diagnosis alone is worthy of attention. Her tact and co-operation here prevent a great deal of misunderstanding, and may often be the means by which delay in the child's progress is prevented.

Secondly, the teacher should never attempt to make a diagnosis herself, or to dispute the diagnosis made by the ophthalmologist. There may be times when the teacher, for some reason or other, becomes suspicious that a child is suffering from this or that disease, but she should make it a point to obtain the diagnosis from the ophthalmologist through the regular channels, and she should never allow herself to doubt its accuracy. In going to the ophthalmologist for information she should always be sure to have the permission of the parents. The teacher should never attempt to classify the child on the basis of her own findings.

Confidence in Medical Diagnosis

The teacher should be careful never to raise any doubt in the minds of children or parents as to the quality of medical care they are receiving. I have several times had children, whom I had previously fitted with glasses, return stating that their school nurse

said the glasses were not right. Nothing is more exasperating to a doctor. But worse than that is the feeling of distrust which is implanted in the minds of the parents. Usually the reason for such a statement on the part of a nurse is that she has tested the child's vision with his glasses on, and has found it to be only 20/40, let us say. Without thinking, she jumps to the conclusion that if the glasses were right, the vision should be 20/20; what she does not think of is that there may be present some condition that prevents the vision from being better than 20/40 with even the best fitted glasses.

Teacher's Influence on Parents

The teacher should do all she can to have the parents follow the physician's orders. Parents are sometimes prone to discontinue treatment without cause. In cases of interstitial keratitis, for example, treatment of the syphilitic condition is necessary for many months after the ocular condition has become quiet, and the teacher should do her utmost to co-operate with the ophthalmologist in seeing that the parents understand this.

Visual Levels for Sight-Saving Class Pupils

Now, as to the visual levels for sight-saving classes: I think there is more or less an agreement as to what these are. In the first place, any pupil—even with 20/20 vision in each eye—is a candidate for a sight-saving class if he is a victim of an eye condition which hard use of the eyes might cause to progress. Many children with progressive myopia have 20/20 vision with glasses, but all should have the advantage of the sight-saving class. I think this is well understood. Secondly, any child whose vision in the better eye is so poor as to handicap him in the work of a regular group should be in a sight-saving class. Usually the limit here is 20/70 in the better eye. In Detroit, the usual limit is 20/70 or worse in the better eye. In Ohio, sight-saving classes enroll children whose vision is between 20/200 and 20/70 in the better eye, together with children suffering from progressive eye diseases. In New York State, the following regulations are in force:

“The eligibility of children to sight-saving classes depends to a great extent upon the consideration of individual cases,

but the following four types make education in the regular grades practically impossible:

- "1. Children having more than 20/200 vision but not possessed of sufficient visual acuity to enable them to read ordinary print or to see letters and figures on the black-board.
- "2. Children with progressive eye difficulties.
- "3. Children with diseases of the eye which seriously affect their vision.
- "4. Children who are able to read ordinary print, but only at the expense of their vision.

"The question may arise as to what specific types of cases may serve as a guide for class selection. If so, the following may serve the purpose:

- "1. Children who cannot read more than 20/70 in the better eye with correction.
- "2. Children who have progressive myopia, even though glasses may bring the vision nearly up to normal.
- "3. Children suffering from eye diseases in which some irritation may be present—provided the approval of the attending physician is given.
- "4. Any child who, in the opinion of the ophthalmologist, would benefit by assignment to the sight-saving class, subject to the acceptance of the educational authorities having charge of such classes."

These are the upper limits. The lower limits—that is, the limit between sight-saving classes and braille classes—is more definite, and brings us to the question of what constitutes blindness.

Definition of Blindness

One of the difficulties in collecting statistics of blindness is the lack of common agreement as to what we mean when we speak of blindness. Sometimes "total blindness" is referred to; sometimes "inability to read with glasses," or "to see enough to carry on an occupation." Of course there are different degrees of blindness. The average individual usually assumes that a blind person is one who does not see anything—or possibly one whose maximum vision barely enables him to see light. It is said that this description

would cover about one-half to two-thirds of the persons usually considered blind.

The Committee on Statistics of the Blind groups the blind into categories as follows:

- "0. Absolute blindness.
- "1. Totally blind, or having light perception only.
- "2. Having 'motion perception' and beginning 'form perception' (up to 5/200).
- "3. Having 'traveling sight' (5/200 to 10/200).
- "4. Having ability to read large headlines (10/200 to 20/200).
- "5. Borderline cases (20/200 or more, but not sufficient for use in an activity for which eyesight is essential).
- "6. Better than 20/200, but having peripheral vision limited to 20° or less in the widest diameter."

Persons in these categories are eligible for braille classes.

We can accept the definitions adopted unanimously at the Congress for the Blind in Königsburg in 1927:

"A child is practically blind and should be educated in a school for the blind whose vision is from 0 to 8/200.

"A child is partially sighted and should be educated in a sight-saving class when he has vision from 8/200 to 20/80, provided the vision is sufficient to make practical further education for a profession or occupation followed by seeing people.

"Supplementing the above, we add that, besides visual acuity, fields, color sense, and near vision must be taken into consideration when defining this class of children."

In one of its pamphlets, the National Society for the Prevention of Blindness indicates who should be placed in sight-saving classes. They advise that, in addition to all children having 20/70 or less vision in the better eye after correction, any child with progressive eye disease, and any child calculated by an ophthalmologist to benefit, should be admitted to a sight-saving class. It is further suggested that each child must be considered as an individual. Roughly, this may be taken as the basis for admission to sight-saving classes.

I should mention another type of "blindness." You have perhaps all heard of the disease "retinitis pigmentosa." In this disease there is a gradual progressive decrease in the size of the visual field, ending finally in so-called tubular vision, comparable to looking through a long tube. Here the central vision may be practically

normal—even 20/20—but for all practical purposes the patient is blind.

Dual Rôle of Sight-Saving Class Teacher

The rôle of the sight-saving class teacher is a full one; in many ways she is a teacher and a social worker combined. She must interpret the doctor's findings and give her pupil an understanding of the condition and its needs, in order that there may be willingness to follow the treatment prescribed. She must interpret the patient's social and personal problems to the doctor, in order that he may judge of their significance and advise in the necessary adjustment. She must inform the doctor of relevant facts, gained from her acquaintance with the family, which may have a bearing on the cause and progress of the eye involvement. She must help secure examination and treatment of other members of the family when the need is apparent or even suspected. She must try to see that patients report for treatment or check-up as directed. She must help in the solution of such economic or social problems as may be interfering with successful treatment.

The Part the Doctor Can Play in the Prevention of Blindness*

J. V. Cassady, M.D.

DESCRIBES the possibilities for state conservation of vision committees in preventing blindness, and presents a suggested program for such societies.

TO DETERMINE what the medical profession is doing in the field of prevention of blindness, I sent a questionnaire to each state medical society secretary, as well as to the American Medical Association, asking about a committee for the conservation of vision, and what special activities it was engaged in. I received many interesting and instructive replies, and one amusing one that I believe you will appreciate:

"Replying to your inquiry as to whether we had developed yet another committee, this time on the conservation of vision, beg to advise that we have not done this.

"As a matter of fact, if we of the medical profession continue to grind out so freely committees in states like ours, with a very limited membership, the committees will soon outnumber the total membership. Several years ago, when we were much younger, 'twas the common yet very truthful remark that the Americans were a race of club-makers and organizers at large, ranging from the nimble but often turbulent Shriners away down to the modest order of Peewees, with hundreds of ladies' organizations between. And in these later years, with the Uplifters and the Rooseveltians, we are not only continuing the clubbing process but have become mildly delirious in the process."

This reply of "No, we have no such committee," is, of course, more lengthy than others I received.

* Presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, October 27, 1939.

There is no national policy so far worked out by organized medicine for conservation of vision. Perhaps this is not possible, but the Indiana doctors believe that a national program sponsored by the American Medical Association, with due regard to local situations, should be planned and put into effect. This is part of the Indiana plan which the American Medical Association adopted at its San Francisco convention. I should like to review briefly the activities of organized medicine in the field of visual conservation that are operating at this time. The activities of Indiana are given in more detail than the others because of my better acquaintance with them, rather than because of their superiority.

The American Medical Association contributes to the conservation of vision program:

1. Through the radio, at least one script a season is devoted to this subject.
2. Through *Hygeia*, articles on vision and eye health are presented at intervals.
3. Through pamphlets and reprints.
4. Through radio talks, prepared for use or sponsored by local medical societies.
5. A new committee is being formed to investigate the incidence and causes of blindness and report at the next meeting.

What State Medical Societies Are Doing

Individual state medical societies which were questioned about committees on the conservation of vision replied as follows:

Arkansas has no such committee.

California and *Colorado* co-operate with the Public Welfare Department in their activity, but have no committee.

Delaware plans such a committee this fall.

Georgia has a committee which has confined its activities so far to work on the cross-eyed child.

Hawaii co-operates with the Territorial Bureau of Sight Conservation.

Illinois has no committee, but a very active state society for the prevention of blindness.

Indiana has adopted a statewide program of preventive medicine which includes conservation of vision.

Iowa has no such committee.

Kansas co-operates with the Public Welfare Department in

a prevention of blindness campaign, has sponsored additional sight-saving classes, and distributes pamphlets for conservation of vision.

Kentucky has a committee co-operating with the director of the Trachoma Bureau and intends enlarging its prevention of blindness program.

Louisiana and *Maine* have no such committee, but believe it would be well to have one.

Maryland's medical society co-operates with the Maryland Society for the Prevention of Blindness, but has no separate committee.

Massachusetts and *Michigan* have no committees for the conservation of vision.

Minnesota has a committee working with the State Board of Control, making a survey of the causes of blindness.

Mississippi has none.

Missouri and *Nebraska* have had a committee on the conservation of vision since 1938.

New Hampshire has such a committee, which co-operates with the Blind Assistance Division of the Public Welfare Department.

New Jersey just established a committee.

Nevada, *North Carolina*, and *North Dakota* have no such committee.

Ohio is planning a more active movement toward the conservation of vision in the near future.

Oklahoma has a committee, but so far has not outlined its program.

Pennsylvania has such a committee which sponsors educational and local programs, as well as carrying on a campaign to have ophthalmologists certified by the Board. Directional interest of local county societies is maintained by the state organization.

The *Philippine Islands*, *Rhode Island*, and *South Dakota* have no committee of the medical society for visual conservation.

Tennessee has one co-operating with the health department, sponsoring sight conservation classes, and working through physicians and hospitals for a sight restoration program.

Texas, *Utah*, *Virginia*, *West Virginia*, *Wyoming*, and *Washington* state medical societies have no such committee.

Wisconsin has a committee on visual defects. Visual reading tests are done for all county and city school children. An attempt is being made to set up a program of visual examinations of all industrial workers similar to the general medical examination.

In Indiana, the State Medical *Journal* is used as a central forum for an educational program for all county organizations, with certain topics emphasized each month. The county society uses this topic for its month's program, as well as using speakers at service clubs, parent-teacher and other lay organizations for education of the public. For example, one month is devoted to cancer; one to tuberculosis; one to conservation of vision. With county medical society programs, State *Journal* articles and educational propaganda used, this subject is thoroughly presented. Each county society has a local committee on conservation of vision, picked by the local society, and interest and activity of this local committee is directed by the state organization.

Indiana already has prenatal, premarital blood Wassermann and anti-fireworks laws, as well as in many places ordinances prohibiting air rifles. The ophthalmia neonatorum law is too lax—15 per cent of Indiana's blind school children are blind from ophthalmia neonatorum. The Indiana State Medical Society has requested the board of health to enforce the present law, and to urge the passage of a more comprehensive law at the next legislature. Trachoma accounts for ten per cent of the blind among the blind pensioners of Indiana. The public welfare department is taking an active part in its treatment. The medical society is asking the board of health to take an active part in its prevention and control. In addition, each county medical society committee will assist and assume leadership in the community for its management.

The press, radio, and exhibits for the public at state fair and medical society meetings were used in an educational campaign for the conservation of vision. Indiana's conservation of vision committee has been set up on a five-year basis, staggered over this period to insure a continuity of policy.

As is easily seen from the above outline of different medical society activities, there is no uniformity in the programs, and efforts are too widely scattered. Visual defects, eye diseases, and blindness are everywhere, and the problems for the prevention of blindness are similar in various localities. A united effort should be made by organized medicine to work out a national program for the prevention of blindness applicable to local conditions. The medical profession in the past has been mainly interested in the treatment

and alleviation of disease; but with its voluminous literature, built from years of experience in observation and management of illnesses, it is time to embark upon a broad, extensive program of disease prevention.

Physicians individually practice preventive medicine to some degree. Diphtheria, smallpox, typhoid, malaria, puerperal sepsis, and other infectious diseases have been forestalled, and their favorable morbidity and mortality statistics can be largely attributed to the activity of the medical profession. These diseases were of community interest and so prevalent that the public, health departments, and the medical profession were all interested in them.

Other diseases, such as venereal diseases, arthritis, tuberculosis, cancer, and heart disease, which have had specialists for their study and treatment, have needed the stimulation of some lay organization for their prevention. In eye diseases, although measures for controlling glaucoma, trachoma, ophthalmia neonatorum, infectious diseases, squint, tumors, and many other serious eye diseases have been developed by oculists, physicians and laboratory workers, it has taken the stimulus derived from such an organization as the National Society for the Prevention of Blindness to correlate measures that may be used for their universal prevention. These, like other diseases, are not aware of state boundaries. A national policy of anticipation of eye disease, with reduction of eye hazards on a national scale, is necessary for prevention of blindness. This Society can do this more effectively than any other. I want to take this opportunity to pay tribute to the officers and personnel, as well as to the founders, directors, and members of the National Society for their splendid co-operation, directional assistance, and aid to Indiana's and other similar state medical societies' programs.

Sight Conservation Program for the Medical Profession

The educational program should be directed toward medical schools, universities, public instruction departments, school nurses, teachers colleges, social workers, and industry, as well as to physicians, so that they may constantly keep in mind measures for the prevention of blindness. After the professional groups are mindful

of blindness, the public should be educated to demand a 50 to 60 per cent reduction in its incidence.

Adequate facilities for providing service to schools, industries, and the public, so that no one be denied medical care, are necessary. Trachoma clinics; facilities for supplying glasses; sight-saving classes; examination of school children and of industrial workers; facilities for adequately treating ophthalmia neonatorum and syphilis; goggles; safety devices; good lighting in homes, schools, and industry; anti-fireworks legislation; prenatal and premarital blood Wassermann laws; clinics, hospitals, and physicians trained to recognize, treat eyes, and conserve vision; all these are parts of the service program.

Prevention of Blindness Activities for a Medical Organization

The following outline is, in rough form, the type of program that probably should be adopted by the local, state, or national medical organization in a prevention of blindness campaign:

1. Hereditary and Congenital Eye Defects

- a. Advocating premarital and prenatal blood Wassermann tests.
- b. Urging treatment of syphilis, especially during prenatal period.
- c. Educating public on need for adequate prenatal care, diet, sufficient vitamins, sunlight, fresh air, good hygiene, and regular examination during the prenatal period.
- d. Informing the public that retino-blastoma, hereditary myopia, and congenital cataracts are among the conditions transmissible from parent to child.

2. Conjunctivitis of the Newborn

- a. Promoting a comprehensive ophthalmia neonatorum control program, bearing in mind the following:
 1. Prophylactic should be approved by the board of health—usually one per cent silver nitrate.
 2. All cases should be reported to the board of health.
 3. Board of health should be responsible for treatment.
 4. The facilities should be provided (oculists and nurses) to treat conjunctivitis of the newborn.
 5. All cases of conjunctivitis of the newborn should be considered as gonorrheal until proved otherwise.

3. Eyes of the Preschool Child

- a. Promoting accident prevention through public education and encouraging anti-fireworks, anti-slingshot, and anti-BB gun ordinances.
- b. Advocating the early treatment of squint, through public education and through providing treatment facilities.
- c. Advocating inclusion of a vision examination in general physical examinations by pediatricians, family physicians, dispensaries, clinics, hospitals, and in summer round-ups of preschool children.
- d. Educating the public on the relationship between general infectious diseases and diseases of the eye.

4. School Vision

- a. Advocating vision testing by school nurses, school physicians, oculists, and teachers, and arranging for provision of glasses, treatment, or more complete examinations by oculists.
- b. Urging the use of sight-saving classes for children whose corrected vision is too poor for attendance in regular classes.
- c. Calling attention to need for adequate lighting—15 foot-candle illumination on each desk.*

5. Conservation of Vision in Industry

- a. Co-operating in safety campaign for large and small industries, including garages.
- b. Advocating the use of safety devices and goggles in occupations with hazards to the eye.
- c. Advocating vision testing and eye examination for workers upon application, and at periodic intervals, by oculists.
- d. Promoting the use of adequate lighting in industry.
- e. Providing information on the necessity for preventing spread of infectious diseases in industry; need for hygienic working conditions, and for isolation of infectious diseases; also the need for providing facilities for treatment of infectious diseases.

6. Trachoma or Other Local Eye Conditions

- a. Educating the public and professional groups on trachoma.

* *American Recommended Practice of School Lighting*. New York: Illuminating Engineering Society and American Institute of Architects, 1938.

- b. Urging of adequate facilities for treatment of private and indigent patients, and obtaining the co-operation of the health department.
- 7. Eyesight Conservation in Private Schools and Colleges
 - a. Advocating pre-entrance and periodic eye examination by oculists.
 - b. Promoting good hygiene and adequate lighting in the schools.
 - c. Promoting distribution of educational material on eye health and vision conservation for the pupils.
 - d. Advocating the provision of reading clinics where necessary.
- 8. Sight Conservation in Relation to General Diseases and Diseases of the Eye
 - a. Educating the public and arousing the interest of professional groups in the possible eye complications of hypertension (high blood pressure), diabetes, nephritis (Bright's disease), and focal infections.
 - b. Educating the public and arousing the interest of professional groups in the nature and need for treatment of such conditions of the eye as glaucoma, malignancies, eye injuries, cataracts, and corneal ulcers.
- 9. Co-operation of Medical Organization with Other Agencies

Following are some of the local groups with which the medical profession can co-operate in maintaining a thorough sight conservation program:

 - a. Public health workers.
 - b. Public welfare workers.
 - c. Public schools.
 - d. Physicians, hospitals, clinics and dispensaries.
 - e. Service groups.
 - f. Parent-teacher groups.
 - g. Nursing groups.
 - h. Social service workers.
 - i. Newspaper, radio, and other public information groups.

Need for Medical Profession to Assume Its Responsibility

If the incentive and request for a prevention of blindness campaign originates in the medical organization itself, it will be much more likely to be effective in securing the co-operation of physicians than if a social, public health, or welfare organization institutes it.

The general practitioner can do more to save vision than any organized small group, like oculists, school nurses, public welfare, social, or public health workers. By the time these patients reach the welfare department, they are like the cancer patient who comes to the cancer clinic—their condition is beyond help. The family doctor who thinks of conservation of vision sees early ophthalmia neonatorum, squint, eye accidents, syphilis, infectious diseases, glaucoma, trachoma, and other diseases that take the largest toll of vision. He can be the closest family adviser in matters of visual conservation.

Such a program in a broad way is applicable to any organization. Whether it is administered by the public health, public welfare, medical organization, or lay society, it must be all-inclusive to meet all of the problems of the prevention of blindness in all schools, all industry, all homes, and in public. The measures to carry out this program should have the co-operation of organized medicine to obtain the education, interest, and service of the general physician, if they are to reach the earliest eye diseases and hazards before they are serious enough to appear as blindness.

What State Supervising Ophthalmologists are Doing in the Prevention of Blindness*

V. M. Hicks, M.D.

DESCRIBES major prevention of blindness problems as related to local conditions in South Carolina, and outlines the activities of the state supervising ophthalmologist.

IN PLANNING this paper I have tried to present something on the following points: the situation in North Carolina; some information from other states; my work as consulting ophthalmologist; some of the reasons why our state agency for the blind is the logical agency to sponsor our prevention work; major problems which have presented themselves to this agency and how we are solving some of them.

We have in North Carolina a population of approximately 3,200,000 people. Estimating, 1,450,497 of these have some degree of eye defects. According to the conclusions drawn in the President's study,[†] at least one-third of this group, or 483,489, would be classed as indigent. There are in North Carolina approximately 99,000 school children needing eye care, and of this number approximately 33,000 are indigent. We have found 6,080 blind in our state, 4,000 of whom are unnecessarily blind from causes that could have been prevented.

Before the passage of the Federal Social Security Act our state legislature passed an act creating the North Carolina State Commission for the Blind, under the sponsorship of lay groups interested in the problems of the blind and prevention of blindness.

* Presented at Annual Conference of The National Society for the Prevention of Blindness, New York City, October 27, 1939.

[†] *Report on Economic Conditions of the South*, National Emergency Council, July 25, 1938. Published by the United States Information Service, Washington, D. C.

This Commission began functioning late in 1935, but since the program was sponsored by lay groups it was unfortunately launched before the physicians or even the ophthalmologists generally knew of the existence of the Commission. Because of this lack of knowledge and understanding, a strong wave of antagonism developed among the eye specialists, and without any thorough investigation, the whole program was privately condemned on the grounds that it was state medicine and they would have none of it. This situation has made difficult the first few years' work of the Commission. Persistent contacts and gradual persuasion have been necessary to get any type of co-operation. Then came the Social Security Act, and the economic needs of the blind were so great that the examinations were rushed through in order to permit as many as possible to receive the relief funds available. The result was unsatisfactory records which do not give the information needed for follow-up work and for an understanding of the real causes of blindness.

Now in my state it seems that we have turned the corner and are beginning the development of a far-reaching program. Most of the ophthalmologists now understand that the real function of the Commission in the field of prevention of blindness is to help them give their professional aid to the indigent of their community and to help educate the whole community to the importance of proper eye care. This realization gives the specialist an entirely different point of view. It places him at the head of the program in his community. I might mention here two policies which the Commission has adhered to from the beginning and which have proved very beneficial in convincing the ophthalmologists that the Commission is concerned with rendering a real service to the indigent and that it is using its efforts to give its best to those unfortunate people whom it was created to serve, namely: the Commission confines its eye care program entirely to the medical profession, and it has set up a high standard for its operative work in that men doing its operations must be certified by the American Board of Ophthalmology and must also be successful surgeons.

It now seems in our section and over the country as a whole that the program for aid to the blind and the prevention of blindness has existed for a sufficient period for us to take stock of it. I presume that is the main reason why we are here tonight.

When I accepted the invitation to appear on this program, I wrote the consulting ophthalmologists in the states participating in the Social Security programs, requesting information on various points. Not all of them replied. When I read the replies, intending to tabulate them, I realized that it would be impossible because of the total lack of uniformity between the states. Some have whole-time ophthalmologists and others work entirely at the desk, giving very little time. The annual compensation ranges from several thousand dollars to nothing. The duties range from having complete responsibility for the medical care program in the state to simply countersigning the medical reports. The reports indicate, and it is my opinion, that the consulting ophthalmologist should be a private practitioner who has a personal social interest in the state work to the point where he is willing to give a portion of his time as consultant and adviser and, at times, be an actual worker for the Commission in the development of its state program. The compensation should depend on the ability of each Commission to pay. There has been in the past a great deal of confusion as to what the compensation to private practicing ophthalmologists should be. It is my opinion that this question will be continuously pushed farther into the background as the local ophthalmologist is made to appreciate the fact that the work is among his people who are indigent and who need his help.

As consulting ophthalmologist for the Commission, I advise with the executive secretary on medical policies; assist in the drafting of and approve medical forms; perform the eye operations for the Commission in the eastern district of our state; hold an eye clinic one day each week for the indigent persons in our section sent to me by the Commission; examine and countersign the medical reports for blind persons who are to receive Social Security aid; advise with and give instructions in eye care to the medical social worker of the Commission; and serve as a member of the recently appointed medical advisory committee to the Commission.

In developing our program for the prevention of blindness and for the provision of medical care for the visually handicapped indigent, we in North Carolina have felt that a state agency for the blind is the logical agency to direct this work, co-operating with other agencies directly concerned, such as boards of health, educa-

tion, labor and welfare. Our opinion is based on a number of factors—a few of which I will mention briefly.

First, when the program of eye care is lumped in with other general medical care programs, it is usually saved for the last and never reached. "Eye care" thus becomes a sort of "red-headed stepchild" unless it can be made the chief medical work done by one agency, such as a state agency for the blind. This is true largely because it is so difficult to arouse public concern and understanding of defective vision since it is usually not obvious or contagious and is often gradual and does not immediately disable to a large degree. Also the profession of ophthalmology is so highly technical that its importance and possibilities are usually understood only within its own special professional group.

Second, an agency for the blind is far more conscious of the problems presented by defective vision and can closely co-ordinate and correlate its work in the field of prevention with training, rehabilitation and its other service programs. The same lay groups interested in the other phases of its work can become the nucleus for a public education program in prevention of blindness.

Third, prevention of blindness requires not only medical service but case work service as well, and an agency for the blind which has on its staff social workers also trained in eye care is in a much better position than any other agency to work with the medical profession in handling the problems involved. Case work treatment must often precede or follow the medical care given by the specialist; for example, a patient is often unwilling to risk an operation, even if the prognosis is good, or the family may have superstitions or religious scruples which must be overcome. Even in the case of refractions there is often the problem of personal adjustment; for example, the sensitive girl in her teens may refuse to wear unattractive heavy lenses which may be necessary. Other recommendations of the physician regarding diet, the removal of possible sources of infection and the securing of funds from lay groups to make possible the carrying out of these recommendations are functions of a case work agency.

Fourth, an agency for the blind has more accurate monetary costs regarding the results of defective vision which may be presented to legislative or other groups and it is the agency most

vitaly concerned with prevention, because through prevention it is saved the expense of a pension, placement in a sheltered workshop, etc. Also an agency for the blind, because of its experiences, realizes more completely the social, psychological and other costs to the individual suffering from defective vision.

Fifth, in a decentralized statewide program involving medical care, it is necessary that opinions of local ophthalmologists be given much consideration and, since an agency for the blind is a non-medical group, it can have a program sufficiently flexible to meet this need.

After having accepted the responsibility of an eye care program as its major activity, the Commission found itself faced with the following immediate problems:

1. The problem of finding the visually handicapped in North Carolina and of securing a diagnosis by a qualified ophthalmologist.
2. The problem of limiting eye surgery to the best qualified men.
3. Lack of funds and staff. For the first two years, the Commission had an appropriation of only \$25,000 for its program of prevention, rehabilitation, home teaching and other services in the one hundred counties of our state. This appropriation has now been increased to \$31,044.
4. Lack of knowledge on the part of the medical profession regarding aims and activities of the Commission in the field of prevention of blindness and a feeling on the part of many of the doctors that this was just another state agency trying to go into state medicine.
5. The need for limiting the diagnosis and care of the visually handicapped to ophthalmologists.
6. The absence of a definite standard for ophthalmology within the medical profession.
7. The large number of counties in the state having no ophthalmologists.
8. The lack of or inadequate preliminary eye examinations given school children.
9. How to formulate plans acceptable to the ophthalmologists which, by establishing a continuing clinic, would service the indigent persons in the state needing eye care.
10. How to convince the ophthalmologists of the importance of

making an eye record on the visually handicapped indigent persons and sending it to the State Commission for the Blind for follow-up work and for its statistical value in public education and in planning future eye care programs.

A satisfactory solution has been found to a number of these problems but we are in the process of solving many of them and of meeting the new difficulties which arise in the solving of any problem.

Through the assistance of WPA we were able to make in our State of North Carolina a comparatively thorough survey of the population to determine the number of blind. The surveyors found 6,080 came under the classification of blindness. Of this number, 2,699 have been examined by an ophthalmologist; 559 of this 2,699 were recommended for operation, and 104 for treatment. Our immediate problem was to provide surgical service to as many of this group as possible. Since the program had found disapproval with the medical profession and the majority of ophthalmologists were not co-operating and since the best convalescent care could be provided for the blind client in a central preventorium, such a preventorium was established at the State School for the Blind Infirmary and more than 100 operations were performed the first summer with most gratifying results. Now, arrangements are made for operations to be performed in five general hospitals in the state, each servicing a particular section and the operating being done by a well-qualified surgeon. Since its creation, the Commission has arranged for more than 10,000 indigent persons to be examined, of whom more than 400 have been operated upon, and 4,670 refracted. With this assistance, more than 500 have been removed from the classification of blindness.

In the beginning years of the Commission's work it used whatever ophthalmologists would co-operate with it in holding eye clinics for indigent school children in various sections of the state. It is now developing a much more constructive program which will provide continuing community eye clinics and which will include the instruction of all teachers in the giving of preliminary eye examinations so that every school child may be examined and those appearing to have defective vision examined by the local or nearest ophthalmologist. Those children of indigent parents will be sent to

the eye clinic and those whose parents are able to provide eye care will be sent to the private practitioner. Here the social worker can do a splendid service, because we all realize the danger of pauperizing self-supporting citizens. Men holding these clinics are to be men who are confidentially approved by an advisory medical committee.

In meeting its problem of lack of funds and staff the Commission has secured the co-operation of county health, welfare and school officials and has gotten civic and service groups to raise money to help finance the work. The Commission has now secured the service of a voluntary advisory committee composed of five leading ophthalmologists from the various sections of the state. This group will consider all medical policies and programs and will make its recommendations to the Commission. Those counties having no ophthalmologist will be serviced on a district basis. There will be a definite public education program carried out in connection with the establishment of the continuing eye clinics and in connection with the preliminary examination of children by the teacher.

In the future, information regarding the Commission's program will be given regularly to the medical profession in order that it may be kept informed regarding the objectives and accomplishments of the program.

The Commission plans to make a survey of those counties having the highest percentage of blindness, having examined insofar as possible all persons suffering from defective vision within the county.

As I have said before, the Commission uses only ophthalmologists in its medical care program and, for its operations, it uses men qualified by the American Board of Ophthalmology who have demonstrated without question their ability as surgeons, and it is planning to use in its general program of eye clinics those eye specialists given confidential approval by the Advisory Medical Committee. We are hoping to get some federal money for our prevention of blindness work in North Carolina and we are hoping to secure increased funds from civic and service groups and our state legislature, as well as to secure some funds from local governing bodies. Our program is young in North Carolina. We have made many mistakes and we will make others in the future, but we feel that we are building on firmer foundations and that, in the

future, we will be able to render more adequate service to those needy persons who are visually handicapped and whom the program exists to serve.

It can be justly charged that this paper fails to adhere closely to its title and this brings out perhaps the most important point. A consulting ophthalmologist will do his best work only when he is thoroughly familiar with the program of the national and state organization and is giving this program his enthusiastic support. The lay and social workers connected with this great effort must recognize that the actual professional work must be done by the best-trained medical men in the state. The entire program places all groups on common ground and this great aim to help the helpless will create a co-operative effort that cannot fail.

Personal and Group Responsibility in Prevention of Blindness

C. E. Rice, M. D.

AN appeal for acknowledgment of individual responsibility—the most constructive force in any public health endeavor—by the citizen, the physician, the parent, and public, private, and professional agencies engaged in sight conservation.

THE thought I wish to dwell on is that personal responsibility and personal initiative are the most constructive forces in any public health endeavor. It is certainly true in the specialized public health field of sight conservation.

There may be a feeling in some quarters that government can take the place of personal responsibility or personal initiative. This is a serious mistake. What government can do, however, or what private agencies can help do, is, through proper organization, planning, and effort, make personal responsibility a truly effective force.

To the extent that the average citizen lacks the will or the knowledge of what to do to conserve his own sight or the sight of those for whom he is responsible—to that extent the best public health machinery in the world will be ineffective.

In this area of personal responsibility for conserving sight and preventing blindness, there are six outstanding groups of key persons: the practicing physician; the individual citizen; the citizen as a parent; public agencies; private agencies; and professional agencies.

The first three of these groups have close, inescapable personal and moral responsibility for preventing blindness. In fact they are the only persons who do actually prevent blindness. They are the

* Presented at the Annual Conference of the National Society for the Prevention of Blindness, New York City, October 27, 1939.

ones in the front line trenches of this warfare. If they fail at any point, there is disaster.

Responsibility of the Physician

We must divide the physicians into two groups: (1) the general practitioner, and (2) the eye physician.

Both have definite responsibility. The general practitioner has three duties, the performance of which will prevent much blindness. These three duties are:

1. An adequate search for and treatment of syphilis as it occurs in his practice, especially in the prospective mother.
2. The proper use of effective prophylaxis in the eyes of the newborn.
3. Enough knowledge of eye conditions to know when to refer a case to an ophthalmologist.

The proper performance of these three duties would probably prevent 40 per cent of blindness.

Under the urging of various private agencies, the government has stepped into the picture here with organization that is very helpful and effective in preventing blindness from some of these conditions, provided the physician makes use of such organization.

Some of the organization that I speak of is the free distribution of silver nitrate by many state health departments, the free serological test, and the distribution of the necessary drugs for the treatment of syphilis by the same agency. Then one should mention the reporting of cases of ophthalmia neonatorum with proper follow-up which is required in many states. This is effective practical organization by the government to help make effective the personal responsibility of the general practitioner.

Reporting of ophthalmia neonatorum is not so good as it should be. There is considerable misunderstanding as to who is responsible for reporting. The eye physician when starting treatment of such a case probably thinks the general practitioner or the midwife has already reported it, so neglects to do so himself. Follow-up investigation is important in real cases of ophthalmia neonatorum.

What about the personal responsibilities of the eye physician in this field other than to treat individual cases referred to him?

It would seem that there is a definite contribution to be made here in stimulating and aiding in the continuing education of the general practitioner in the eye field. Many eye physicians will state that when papers on such subjects appear in the general program of county and state medical societies, there is hardly any attendance of general practitioners. In reply to this it can probably be said that not enough thought has been given to what would appeal to such men. If an eye physician insists on speaking about his method of cataract extraction before a group of the general profession, then he should be willing to spend some money on a medium that will not only convey his ideas but will hold the attention of such a crowd. However, there are other more interesting subjects than cataract extraction that can be presented to the general practitioner.

The eye physicians have the responsibility of helping educate the lay public on eye hygiene in terms that the public can somewhat comprehend. This effort might be fitted into the general subject of lay education now being undertaken by so many state medical societies. Here again some time and money might profitably be spent putting into appropriate, understandable language short speeches on some of the more common eye conditions. It would seem worth while to try and assemble a cross section of the questions asked at such lay meetings. Such questions might well serve as a guide to what subjects need emphasizing and might also serve as a guide to radio programs.

Over 4,000,000 people seek an eye examination or refraction in this country every year. The thought cannot be side-stepped that there are many people in the United States who are influenced in their decisions purely by economic considerations as to whether to go to an ophthalmologist for such services or to go somewhere else. In states with a proper responsible private or public agency there is a field here which might be explored which is concerned with the professional responsibility for making an organized effort to make more available through a reduction in professional fees ophthalmological services for citizens below a certain income level.

Responsibility of the Individual Citizen

The next big area is the personal responsibility and personal initiative of the individual citizen. This is the responsibility which the citizen has for conserving his own sight and is so dependent on knowledge. However, his resulting action or lack of action when he realizes that something is wrong may be motivated by economic considerations.

The individual content of knowledge concerning eye hygiene and eye physiology will differ as individual mental endowments differ and will depend very much on proper exposure to competent teaching. Exposure to such teaching should occur in the elementary school, the high school, and certainly it should be available in the teachers' colleges. There is room for close co-operation here between responsible private and public agencies and the educational authorities of the state.

Responsibility of the Citizen as a Parent

The individual as a parent has a definite personal responsibility for the proper care of his children. The teaching to which the parent has been exposed in childhood will be an important factor here. His course of action will, of course, often be decided by the advice he receives from his physician, from the public health worker, and from his neighbor. Facilities for adult education should be recognized as important for taking up subjects that could not possibly have been of interest in education of youth. The parent who takes time out to train his son how properly to use a firearm is certainly doing prevention of blindness work. The parent-teachers' association that gives consideration to the subject of what household instruments should be allowed in the hands of young children, what toys are dangerous, is doing prevention of blindness.

Organization in this area may take the shape of efforts to influence the program content of parent-teacher organizations and efforts to influence legislation concerned with the sale of explosives for holiday use.

Public and Private Agency Responsibility

We have considered those on whom rests the great personal and moral responsibility to do the right thing at the right time. Be-

hind these most responsible persons are the public health personnel in the county and the teachers in the public schools. These people have a great indirect responsibility in influencing those at the front. Further back in the picture are the co-ordinating agencies, those specialized public statewide agencies such as the welfare and the public health departments. They have joint responsibility in this area of prevention of blindness, not only in making proper use of each other but in jointly influencing and aiding those nearer the scene of action, those who actually have to put into practice those principles of prevention.

Standing to one side are the state and national voluntary agencies, the agencies that are composed of the interested citizens of the state, the agencies which have no official responsibilities. Their main functions, as I see them, are:

1. To fill the gaps left by the official agencies.
2. To suggest and aid in new operating departures.
3. To watch for laxness in the official agencies.
4. To help interpret to the citizens of the state the objective of the official agencies.
5. To serve as a medium of information for the general public.
6. To undertake certain types of research.

They are real responsibilities.

Responsibilities of Professional Organizations

Here we have organized groups of specialists and both specialists and general practitioners together with organized groups of persons in professions allied with medicine. These groups have or should have committees that concern themselves with prevention of blindness. The members of these committees to be most effective must think in terms of the group approach or mass approach rather than the individual who seeks the services of a physician. One or more members of such committees should inform themselves as much as possible about methods of health education. They should come to realize that there may be available in their own health department specialists in this field who are available for consultation.

Then these organized professional groups may be very instrumental in outlining broad research subjects that some official agency can undertake. It is believed that there are fertile fields among eye

conditions that should be so investigated. Some of our eye societies have already started to develop this field.

Summary

One of the main points I would leave with you is that the success of much of this work of prevention of blindness hinges on the individual, the individual physician, the individual parent, citizen and teacher. The individual must first realize himself that all is not well, he must then have initiative to do something about it, and finally he must have knowledge as to the best course of action. If any one of these mental steps is absent or not properly directed, then the finest of hospitals, an abundance of excellent eye clinics, the best medical profession in the world, and the best public health machinery would be ineffective in preventing disaster in many cases.

A fascist state might work differently, but not a democracy.

News of State Activities

THIS Section is devoted to the reporting of sight conservation activities carried on by official and voluntary agencies throughout the country. It presents information supplied by these groups, and serves as a medium for exchange of experiences. Brief and timely items only can be used, because of the limitations of space

Colorado

"Colorado has already sponsored one rural eye clinic so far this year, and expects to hold two more such clinics before July 1. These sessions usually last six days, the first three days being given over to the diagnosis of all school children having some error in vision, irrespective of status; the last three days of the clinic are taken up wholly by the refraction of the medically indigent. Certified ophthalmologists do the work in these clinics and are remunerated by the Division of Maternal and Child Health of the Colorado State Health Department."

—*Director, Maternal and Child Health, State of Colorado,
Division of Public Health, Denver, Colorado*

"During the year ended December 31, 1939, the Sight Conservation and Prevention of Blindness Committee of the Adult Blind Home and Association for the Blind furnished glasses to 20 people at a cost of \$98.75. In each case a complete ophthalmologist's report was given to the Committee by the Colorado General Hospital Eye Clinic and the Ave Maria Clinic of Denver. This service has proved extremely valuable, as the patients have been in such categories as to prevent their receiving such help under the Social Security Prevention Program."

—*Executive Secretary, State Commission for the Blind, Denver, Colorado*

District of Columbia

"... The District of Columbia Health Department has issued new birth certificates, in use as of January, 1940, which contain a question as to the prophylaxis for ophthalmia neonatorum."

—*Director, Bureau of Maternal and Child Health, Office of the Health Department, Government of the District of Columbia*

"The District of Columbia Society for the Prevention of Blindness has inaugurated a series of Round Table discussions with the novel feature that they were planned by the group participating in them. Invitations were sent to each hospital social service department; to the Department for the Blind of the Family Service Association; to the Public Assistance Division; and to the Social Service Department of the District of Columbia Health Department, with the suggestion that representatives attend preliminary meetings to arrange the series. These representatives selected time, place, and subject matter for the Round Tables.

"Six general subjects, as related to the eyes, are being considered, as follows: General Diseases; Neurological Disturbances; Tuberculosis and Syphilis; Vitamin Deficiencies and Allergic Disturbances; Social Significance of Refractive Errors; and Community Resources for the Visually Handicapped. An ophthalmologist was invited to lecture for 30 or 40 minutes at each of the first four meetings. Following the lecture, a designated member of the group acts as leader in discussing the medical facts just heard, and their application to social workers' use. Many social workers feel inadequately equipped for proper understanding of eye patients. The Society hopes, through the Round Tables, to provide these workers with information as well as to refresh their knowledge. Further, the social worker has a real function in supplementing the doctor, and the purpose of these sessions is to have an opportunity to discuss the rôle of the social worker in meeting the needs of visually restricted patients.

"For the fifth of the Round Table sessions we shall have Miss Elizabeth G. Gardiner, Medical Social Worker of the National Society for the Prevention of Blindness.

"The District of Columbia Society for the Prevention of Blindness has sent out the first number of a small house organ called 'Prevention of Blindness Quarterly.' Although intended primarily as a report to members and donors, this modest messenger is freighted with the hope of creating interest in the Society and making new friends for it."

—*The District of Columbia Society for the Prevention of Blindness, Washington, D. C.*

Illinois

"*Report on One Year's Work for the Chicago W.P.A. Eye Testing Project.*—The W.P.A. Eye Testing Project has been under the direct supervision of the Illinois Society for the Prevention of Blindness since its beginning in December, 1936. This supervision has included the following:

1. Selection of staff
2. Training of staff
3. Setting up of standards for testing and for a correction program

"The staff was selected on a basis of educational background and personality qualification. Four groups were selected for the work: (1) testers; (2) recorders; (3) office workers; (4) a group who could work exclusively on the correction program.

"On this project every child in the schools had his visual acuity tested with the Snellen chart at a distance of 20 feet. We either use an illuminated chart or place it so it has at least ten foot-candles of natural light on it. All deviations from normal were listed by the recorders and sent to the office. The defects were then divided into 1X, 2X and 3X defects, 1X being a defect up to 20/40; 2X, 20/40 to 20/70; and 3X, 20/70 or below. Lists were then made of each of these categories, and work on corrections started on the 3X cases first. The parents of the 1X and 2X cases were notified that a defect had been discovered, and were urged to see someone who could make a complete and thorough examination of the eye. With the co-operation of the principals, more intensive work was done with the 3X cases, who are potential candidates for sight-saving classes.

"During the school year of 1938-1939, 41 high schools in Chicago received this service:

95,213 vision tests were made.

83,022 were found to have normal vision.

12,191 were found to have defective vision.

Of this number, 4,957 were 1X cases

5,931 were 2X cases

1,303 were 3X cases

"During this same period, 224 elementary schools were given this service:

90,926 vision tests were made.

80,206 were found to have normal vision.

10,720 were found to have defective vision.

Of this number, 4,752 were 1X cases.

5,077 were 2X cases.

891 were 3X cases.

"Besides visual defects, all strabismus cases are given special attention. The correction program follows the testing program by an interval of about three to six months. Of necessity this is slower

than the testing program. It is interesting to note where the corrections during this year were made. During the year 6,489 corrections were made. Of this number, 1,458 were 3X cases and 5,031 were 2X cases. No record is kept of the 1X cases to date, although this next year some such tabulation will be made. Of the 3X cases (1,458),

357 went to ophthalmologists
547 went to optometrists
554 went to clinics

"Of the 2X cases (5,031),

1,568 went to ophthalmologists
1,814 went to optometrists
1,649 went to clinics

"As a result of the survey, 102 children were referred for placement in sight-saving classes in Chicago.

"A similar project has been started for the whole State of Illinois. After 12 months, projects have been set up in 32 of the 102 counties of Illinois. A total of 1,341 schools has been finished; a total of 112,664 visual acuities tested; and 10,093 defects discovered. Of this number,

6,249 were 1X
3,114 were 2X
730 were 3X

"The correction program downstate is slower and more difficult than that of Chicago because of fewer facilities and greater distances to be covered."

—Executive Secretary, Illinois Society for the Prevention of Blindness,
Chicago, Illinois

Minnesota

"The recently incorporated Minnesota Society for the Prevention of Blindness will in the very near future begin the soliciting of funds in the state. The date tentatively agreed on is March 20. It will interest the readers of THE SIGHT-SAVING REVIEW to know that the moving spirit in the incorporation of the above-mentioned society is Dr. Frank E. Burch, ophthalmologist of St. Paul, who is now lecturing at the University at Peiping, China. The Society for the Prevention of Blindness has the approval of the Minnesota Academy of Ophthalmology and has, furthermore, the services of a liaison committee representing the Academy. As soon as finances permit, the Society will engage a permanent ex-

ecutive secretary. In the meantime, Mr. J. C. Lysen, superintendent of the Minnesota School for the Blind, Faribault, is serving as the acting executive secretary. Officers of this society are: Mrs. Alfred S. Pillsbury, Minneapolis, President; Dr. Egil Boeckmann, St. Paul, Vice-President; Mr. Louis W. Hill, Jr., St. Paul, Treasurer; and Dr. Frank E. Burch, Secretary to the Executive Committee."

—*Acting Executive Secretary, Minnesota Society for the Prevention of Blindness, St. Paul, Minnesota*

New Hampshire

"On December 27, 1939, a meeting of the Medical Advisory Committee of Ophthalmologists was held at the Eagle Hotel in Concord. Those present were as follows: four of the five members of the Advisory Committee; one member of the Board of the Department of Public Welfare; the Commissioner of the Department of Public Welfare; the Sight Conservation Consultant of the Department of Public Welfare.

"A written report of the interdepartmental meeting of supervisors, and the accomplishments of the Sight Conservation Program since organization of the committee, was given to each of those present. The committee was interested in the number and type of cases reported as cared for in the Sight Conservation Program, and advised the continued care of the medical reports with the added information, 'Visual acuity at time of examination.' This additional information could be used for comparison of corrections of different dates. They approved the complete list of ophthalmologists, both in and out of the state, to be used on the Aid to Needy Blind and Sight Conservation Programs.

"Three test cases on the Aid to Needy Blind program were discussed and referred to Dr. Rice of the Social Security Board in Washington for advice regarding eligibility, in order that we might have the benefit of his contacts with other states. The committee felt that, if possible, the department should assume more responsibility on cases with eye difficulties which are secondary to other physical conditions (when there are no other public or private resources available), with the approval of the Board of the Department of Public Welfare on each individual case. They stressed the fact that Wassermanns should be taken on all patients with eye difficulties, and especially on those cases where there is a suspicion of syphilis. They agreed to do more work on the prevention of blindness, with particular emphasis on eye accidents due to fireworks, firearms and dynamite, etc.

"The chairman of the committee is to give a report of the com-

mittee to the New Hampshire House of Delegates of the State Medical Society when they meet in May. As it was agreed that membership on the Medical Advisory Committee of Ophthalmologists should rotate among the ophthalmologists in the state, in order to create a better understanding of the Sight Conservation and Aid to Needy Blind programs, a new ophthalmologist will be appointed to the committee at this meeting in May.

"It was decided that the chairman of the advisory committee, with the permission of the Governor and his Council, should attend the annual meeting of the National Society for the Prevention of Blindness."

—*New Hampshire State Department of Public Welfare, Concord, N. H.*

"On December 18, 1939, an Interdepartmental Meeting was held at 9 Capitol Street, Concord, New Hampshire. Those present were as follows:

Dr. Mary Atchison, Director, Maternal and Child Health Division, State Board of Health.

Miss Elizabeth Murphy, Director, Public Health Nursing, State Board of Education.

Miss Anne Stephens, Supervisor of Field Services, State Department of Public Welfare.

Miss Louise G. Sexton, Sight Conservation Consultant, State Department of Public Welfare.

Results of the meeting were as follows: It gave us a better understanding of the amount of work covered by the other departments and the difficulties which they meet, as, for instance, the small number of public health nurses to a given population—such as one nurse to 10,000 persons; and the number of towns and school children covered by one school nurse; in some instances, eight towns to a nurse and 2,000 children to a nurse.

"Plans for reaching the preschool child through the Board of Health nurses and maternal and child health clinics were made. Acceptance of the fact that any health program must include emphasis on eye care was evidenced. An invitation was received by the Department of Public Welfare to give a talk on eyes to the Board of Health nurses at one of their monthly meetings. (This talk was given on January 26, 1940, to 35 nurses, and pamphlets on eye care were distributed.)

"In searching for and following through eye cases, regardless of who finances the medical care, the Board of Health was willing to assume responsibility for those needing eye attention from birth to the age of six years; the Board of Education for those from seven

years of age through school age; the Department of Public Welfare, the adult. With this co-operation the department ought to be able to find and care for many of the eye problems in the state."

—*State Department of Public Health, Concord, New Hampshire*

New York

"Observations of a State Prevention of Blindness Worker.—For a number of years I have visited the Glen Cove public schools yearly, by invitation. It has been gratifying to note the improvements which the school system is carrying on in the way of eye protection and eye care. Credit in this persistent improvement is due to four capable workers—Dr. Francis C. Edmonds, Medical Inspector; Mr. Hannibal H. Chapman, School Superintendent; and last, but not least, the two school nurses, Miss Mary Birmingham and Miss May Barnard. They have worked together earnestly and sincerely, endeavoring to carry on year after year a better program in which eyes have had consideration along with all other phases of health work. Recently they invited me to review a group of high school children that they believed had color vision deficiency. They then prepared a list of these students for re-examination. Each student was tested, and only four were found not to have a deficiency. Out of the 800 students in the high school, the 24 who were found lacking in color vision represented 3 per cent of the school population. These figures coincide with nearly all of the textbooks I have ever read. Furthermore, of this group of 24, two-thirds were male and one-third was female, which again bears out the theory.

"I have been very much impressed by the careful testing which resulted in such an accurate elimination. It demonstrates clearly the high type of work which is being carried on in that particular school system."

—*Director, Prevention of Blindness Service, New York State Department of Social Welfare, New York, N. Y.*

South Carolina

"The Division for the Blind of the South Carolina State Department of Public Welfare has held many screening clinics throughout the state. However, the more recent ones were conducted in a little different manner than those formerly held. These proved very satisfactory. In one county, the County Superintendent of Education requested that a member of the staff of the Division for the Blind visit his county and screen the school children. In co-operation with the attendance teacher, the following plan was worked out: The teacher contacted the schools and requested that the teachers refer children who had shown some indication of defec-

tive vision. The attendance teacher arranged to have these children brought in school buses to one of the clinics which were conducted at five different points in the county. There were 647 children screened, representing 23 schools; of this number, 43 were found to have vision of 20/70 or poorer; and 161 had defective vision, though better than 20/70. There were still a large number who had normal vision, but apparently were suffering from some eyestrain.

"The names and addresses of these children whose vision was 20/70 or poorer or who had some other obvious condition, were forwarded to the County Department of Public Welfare, with the request that they be investigated for the purpose of determining whether their respective families were able to supply the examination and whatever treatment might be found necessary. When these investigations are reported to the Division, an authorization will be issued in each instance where a family is unable to supply these services. Treatment will also be given whenever recommended. The Division also forwarded the names of the children who have defective vision—but better than 20/70—with the request that their families be advised and in those cases where the family is unable to secure the services, to endeavor to supply this need through some local community resources.

"Similar clinics were conducted in another county recently, and in this case the Division went into the county upon the invitation of the County Department of Public Health. The nurse made arrangements similar to those made by the attendance teacher just referred to. There were 342 children screened, and 97 had vision of 20/70 or poorer, while 98 had defective vision, but better than 20/70. There were still many others who apparently were suffering from some eyestrain, although their vision was normal. The same plans will be followed in this county as to investigation, examination and treatment, as outlined above. Because of a serious situation found in this county, the Division plans to screen all children and make a survey of the lighting in all schools.

"The community interest in these clinics was most gratifying. Many children had to come quite a distance, and remain at the clinic practically all day. Realizing that most of these would have to remain at the clinic for some time, and realizing that almost all these children were unable to supply any lunch for themselves, the local Red Cross furnished lunch for all children. The clinics were visited by various members of the Department of Education, Department of Health, civic clubs, and other representative groups throughout the country, thus showing their real interest in the work that we are endeavoring to do."

—Chief, Division for the Blind, State Department of Public Welfare,
Columbia, South Carolina

Tennessee

"Report of Activities of the Sight Conservation Service During Its First Year and a Half of Operation.—During the first year and a half of its existence, the Sight Conservation Service has been engaged in the following six major activities:

- (1) A survey of the blind of the state to determine the causes of blindness prevalent in Tennessee.
- (2) The prevention of blindness in those in whom blindness could be prevented.
- (3) The education of the general public in the general care and safeguarding of their eyes and in what they can do to assist in the prevention of blindness, through talks, movie films, the radio, and articles given to various newspapers throughout the state.
- (4) The finding of visually handicapped children eligible for enrollment in sight-saving classes and the establishment of sight-saving classes.
- (5) The restoration of sight to all those to whom sight could be restored, who would accept this service.
- (6) The hospitalization of all trachoma cases by the Department of Public Health at the Trachoma Hospital in Richmond, Kentucky, who would accept this hospitalization.

"The survey of the blind of the state, as to the causes of blindness prevalent in Tennessee, is approximately 60 per cent completed.

"Out of this survey have come the following facts:

1. This survey represents 2,400 cases of blindness, and 51½ per cent, or a total of 1,237 cases, have a chance varying from an excellent one to an outside chance to have sight restored in one or both eyes in whole or in part.
2. Approximately 65 per cent of this blindness could or might have been prevented.
3. This survey has also shown that during the past ten years an average of 130 persons each year have been going blind in Tennessee.

"During the past year and a half, 138 persons have been or are being prevented from going blind through the efforts of the Sight Conservation Service with the co-operation of the eye physicians of the state and various civic groups—chiefly represented by the Lions Clubs. Four of our Lions Clubs (Gallatin, Nashville, Waverly, and Centerville) are carrying on local projects among the

visually handicapped children of their counties in co-operation with the Sight Conservation Service. . . . During this period, 43 talks on the causes of blindness prevalent in the state, and their prevention, have been made by the director of the Sight Conservation Service to various public, civic, and medical groups—reaching approximately 4,500 persons. The talking slide film, 'The Nurse's Responsibility in Saving Sight,' has been shown 20 times before various public groups—reaching approximately 2,325 persons. The transcribed fireworks program, prepared by the National Society for Prevention of Blindness for the Fourth of July, was presented over the air by six radio stations of the state in 1938, and by three in 1939, and since July 1, 1938, no report of an eye injury due to fireworks has been received by the Sight Conservation Service. This, together with innumerable articles released to the press, and the distribution of some 1,200 leaflets at the State Fair this year on 'Tennessee's Need for Sight-Saving Classes,' represents in brief the educational activities of the Sight Conservation Service.

"During this period 80 children have been found who are eligible, because of their visual defects, for enrollment in sight-saving classes. Twenty-seven are at present enrolled in the two sight-saving classes which have been established in Nashville; one in the public school system, which is caring for 15 children; and the other at the Tennessee School for the Blind, which is caring for 12 children. It is hoped that in the very near future another sight-saving class will be established in Nashville, for which a teacher has already been trained and is available.

"During the past year and a half, 247 persons have had sight restored to them in one or both eyes in amounts varying from 2 per cent up, either by surgery, surgery and glasses, treatment, or by glasses alone. Thirty-six persons have had surgical operations to restore sight—of which one has apparently been a failure—and eight persons have refused operations to restore sight, for whom this surgery and hospitalization were arranged by the Sight Conservation Service. Seven persons have refused surgery to prevent blindness, which surgery might also have resulted in the restoration of some sight.

"Ten cases of trachoma have been hospitalized and discharged as cured by the Tennessee Department of Public Health since July 1, 1938."

—*Director, Sight Conservation Service, State of Tennessee,
Department of Public Health, Nashville, Tennessee*

Washington

"The Division for the Blind in the State of Washington is glad to announce that during the latter part of February, public health

nurses' institutes will be held in three different sections of the state. Miss Eleanor W. Mumford, associate for nursing activities of the National Society for the Prevention of Blindness, has been made available to the Division for the Blind and the State Department of Health, working in co-operation in presenting these institutes. Enrollment in each institute has been limited to 50 persons. Medical social workers connected with out-patient clinics have been invited to attend the institutes. This series of institutes is the realization of an effort first put forth two years ago, so we feel particularly gratified in being able to announce the institutes at this time."

—*Supervisor, Division for the Blind, Department of Social Security,
State of Washington, Olympia, Washington*

Territory of Hawaii

"1. Miss Florence Carr, Sight Conservation Worker for the island of Hawaii, who attended the institute for medical social eye workers held by the National Society in the spring of 1938, has received her solo pilot's aviation license. Aviation is her avocation when not traveling the big island in the interest of her work.

"2. The sight conservation worker for Maui County, Miss Rebecca Stoddard, has held two successful eye clinics for school children in rural areas—one on the island of Molokai, which was attended by 78 persons; and a second eye clinic at Lahaina, Maui, with over 100 students attending. This made eye medical follow-up in all schools on the island of Molokai 100 per cent, as well as 100 per cent eye medical follow-up in Lahaina district.

"The island of Hawaii being the largest island and representing the greatest rural population, four eye clinics have been held. One clinic was held in the northern district, Kohala, with 48 persons attending, Kona district, Kau, and Honokaa. The workers organize and arrange for eye physicians to attend the clinic, and have previously carried on vision testing in all schools of the district and made financial arrangements for needy cases, so that after clinic all school children in the district have 100 per cent medical follow-up. The clinics are also attended by preschool children and adults. The field workers on each island have now assumed the responsibility for referring all eye surgery cases to the Bureau of Crippled Children. The maximum number of cases referred have had operations during the fall period."

—*Director, Territorial Department of Sight Conservation and
Work with the Blind, Honolulu, Territory of Hawaii*

Note and Comment

Society's Program During National Conference of Social Work.—

For the first time, the National Society for the Prevention of Blindness, through the chairmanship of its medical social worker, Miss Elizabeth G. Gardiner, is assuming direct responsibility for a program to be presented at the National Conference of Social Work to be held in Grand Rapids, Michigan, May 26-June 1. Following is the preliminary program:

TUESDAY, MAY 28: 2:00 P. M.—3:30 P. M.

Mrs. Mary Hopper Spencer, Executive Director, District of Columbia Society for the Prevention of Blindness, Washington, D. C., presiding.

Possibilities for Restoration of Sight and Prevention of Blindness in the Aid to the Blind Program.

1. As Seen by the Social Security Board.

Ruth Blakeslee, Chief, Division of Policies and Procedures, Bureau of Public Assistance, Social Security Board, Washington, D. C.

2. As Seen by a State Prevention Worker in the Field of Public Welfare.

Anna Harrison, State Medical Social Worker for the Blind, State Department of Public Welfare, New Orleans, Louisiana.

Discussants: Mr. Benjamin E. Youngdahl, Associate Professor of Social Work, George Warren Brown Department of Social Work, Washington University, St. Louis, Missouri.

Mrs. Eleanor Brown Merrill, Executive Director, National Society for the Prevention of Blindness, 50 West 50th Street, New York, N. Y.

Open Discussion.

FRIDAY, MAY 31: 2:00 P. M.—3:30 P. M.

Since finding the early stages of eye difficulties presents the best opportunity for preserving sight, two illustrations of case finding and effective care will be presented by the agencies doing the work.

Mrs. Mary Hopper Spencer, Executive Director, District of Columbia Society for the Prevention of Blindness, Washington, D. C., presiding.

The General Agency's Opportunity for Sight Conservation.

1. Among Children in Four Rural Counties.

Eleanor Hearon, Director of Social Service, Colorado General Hospital, Denver, Colorado.

2. Among Older People.

Margaret W. Wagner, Executive Secretary, The Benjamin Rose Institute, Cleveland, Ohio.

Discussants: Dr. Ralph R. Sachs, Ophthalmologist, Children's Fund of Michigan, 660 Frederick Street, Detroit, Michigan.

Miss Marcella Cohen, Supervisor, Prevention of Blindness Department, Pennsylvania Association for the Blind, 308 South Craig Street, Pittsburgh, Pennsylvania.

Open Discussion.

Congress on Ophthalmology to be Held October 11 and 12, 1940.—A Pan-American Congress of Ophthalmology will be held in the city of Cleveland, Ohio, on October 11 and 12, 1940, according to an announcement issued by the Committee of the Congress, Drs. M. E. Alvaro, Conrad E. Berens, and Harry S. Gradle. All ophthalmologists of the Western Hemisphere are invited to attend. Until such time as the Pan-American Congress can elect its own officers, the American Academy of Ophthalmology and Otolaryngology has volunteered to undertake arrangements, after which the meeting and the future of the Congress will be placed in the hands of its elected officers.

Eighth American Scientific Congress to Meet in Washington, D. C.—In Washington, D. C., from May 10–18, the American Scientific Congress will convene for the purpose of furthering scientific thought and achievement, and to celebrate the fiftieth anniversary of the founding of the Pan American Union. Distinguished scientists and scholars throughout the Americas will join in the examination of problems peculiar to this hemisphere, in the belief that their collective and harmonious endeavors not only advance the boundaries of science, but serve to cement friendly international relations. Not since the winter of 1915–16 has this annual Congress met in Washington. In those years also civilization was confronted with the spectacle of a world in upheaval. It is hoped that

through the Eighth Congress the American republics may demonstrate the uninterrupted scientific activity and advancement promoted by the atmosphere of peace and collaboration evoked by the Pan American Union. Section Five of the Congress—Dr. Thomas Parran, Surgeon General of the United States Public Health Service, acting as chairman—will be devoted to the subject of public health and medicine. The scheduled program of practical discussion by prominent authorities includes the problem of rehabilitation of physically handicapped children in terms of causes, prevention, and methods of treatment.

Connecticut Increases Blindness Prevention Expenditures.—The State of Connecticut Board of Education of the Blind, in its combined annual reports for the two years ended June 30, 1938, presents prevention of blindness expenditures—exclusive of salaries and expense of personnel—for the years 1936-37 and 1937-38, indicating an appreciable increase during the latter period:

	1936-37	1937-38
Ophthalmological examination.....	\$539.25	\$624.25
Corrective surgical or medical treatment*		
Eye care.....	196.44	518.23
Other care.....	158.49	82.95
Glasses furnished		
Simple refractive errors.....	331.24	454.15
Aid in serious defects.....	188.56	377.87
Other services to clients.....	105.38	228.35
Totals.....	\$1,519.36	\$2,285.80

Throwing Light on a World of Activities Through Glass Bricks.—Hundreds of newly constructed or remodelled buildings housing workers of all types are being made more cheerful, attractive, and efficient by the employment of glass bricks. Pleasing to look at, easy to clean, amazingly strong, and versatile in their uses—ornamental as they are practical—they are hailed by engineers and architects throughout the civilized world as a means of erecting factories, offices and homes which are striking to look at within and without, soundly constructed, well insulated and better lighted.

* The Board of Education of the Blind has been able to obtain the nominal state rate at general hospitals for eye care and treatment services, which has resulted in a substantial saving.

The use of glass brick is more expensive than ordinary brickwork or concrete. Although glass bricks are not transparent and do not admit as much light as the same area of sheet glass, their translucence screens an ugly view such as often surrounds factory locations, or insures privacy in a secluded area indoors, while admitting outer light and diffusing into far points of the room a greater relative amount than is admitted through a window of the same dimensions. Engineers claim that while the lighting in the area nearest a glass brick exterior wall is not unnecessarily bright for the activities undertaken within the room, lighting transmission under ideal circumstances is about 76.2 per cent of the maximum for flat surfaces of sheet glass, and the excess light is so directed into the room that, at 20 feet from the wall, the room illumination is considerably higher than that secured through the conventional window.

Hollow or solid glass bricks find practical use in improving lighting conditions when employed as corridor and office partitions or in staircase walls. Since it is now possible to manufacture lenses of glass and concrete sufficiently strong for heavy duty in roofs and ceilings, diffused daylight is made possible in many more factories, swimming pools, theatres, shops, surgeries, restaurants, and other types of buildings, at the same time providing a strong and safe surface for foot traffic.

Facts About the Eye Exhibited.—The New York Museum of Science and Industry includes in its broad range of subject matter an attractive and stimulating exhibit on facts about the eye. Along with the exhibit are moving pictures and lectures presented at specified times.

New Glasses That Work and Play.—While feminine beauty is being enhanced by glittering "costume" jewelry, and present-day homes and cars equipped with useful and decorative articles manufactured from plastics and synthetic resin, a new "glass," ideal for spectacle lenses, has been produced from coal or natural gas or oil, water and air. Perfectly transparent, lighter in weight, clearer and more flexible than the perishable material made for hundreds of years from sand, synthetic resin glass may be molded into lenses which allow of polishing and grinding for optical purposes, yet

which are shock-resistant and inexpensive, making them practical for use by active children whose family means are limited and by industrial workers in hazardous occupations calling for protection against eye accidents.

Certain resin glass products fulfill functions quite beyond the scope of ordinary glass at its best. Most spectacular is the type by means of which light may be "piped" through surgical or other instruments, illuminating anatomical dark corners so that the doctor or dentist works more swiftly and surely. A less conspicuous member of the synthetic glass family is that which forms the "sandwich-filling" layer in sheets of safety glass, lastingly non-brittle and an insurance against the dispersal of glass fragments if a blow strikes.

The number of ultimate uses which will be found for a material as transparent as glass and as unbreakable as wood is incalculable, and, thanks to modern science, it may be hoped that these products will be economically made for the many from cheap and plentiful common substances.

Radio Program Features Safety for Children.—Several songs concerned with the protection of eyesight have been included by Irving Caesar, writer of popular songs, in his radio program known as the "Sing a Song of Safety Club," which is broadcast over Station WOR, New York City, at 12:30 P.M. every Sunday.

These health education lessons, intended primarily for young children, but frequently applicable to adults, as well, have included such lyrics as those entitled, *A Boy Looked Down a BB Gun* and *A Rock Was in the Snowball that Hit Poor Billy's Eye*. The verses are as follows:

A BOY LOOKED DOWN A BB GUN
A boy looked down a BB gun,
He thought it wasn't loaded,
Now wasn't that a silly thing to do?
The boy may never look again,
Because the gun exploded,
A safety lesson let this be for you!

A ROCK WAS IN THE SNOWBALL THAT HIT POOR BILLY'S EYE

A rock was in the snowball that hit poor Billy's eye;
Though meant in fun, the harm was done,
And that made Billy cry;
It's great to play and throw balls of snow that's clean
and white.

But putting rocks in snowballs
May cost your pal his sight;
Remember ev'ry season brings games for us to play,
So in winter play with reason,
And you'll play again in May.

Doctors Hear Plea for More Legible Printed Matter.—"For ages human eyes were used mostly for distance seeing, and there is little if any strain for normal eyes in looking at objects at a distance of 20 feet or more. As the distance between the eyes and the object on which they are focused decreases from 20 feet, the work of the eyes increases." With these words Dr. Leon F. Gray, of Shreveport, in a paper presented before the Louisiana State Medical Society, introduced an appeal for further research into legibility of reading matter circulated to the general public. He said, in part:

"For many centuries, nearly all labor which required close use of the eyes was done outdoors. But as refinement of materials and methods has progressed, it has become both desirable and necessary to do more and more work indoors. Less than 500 years ago, few people could read. Then came the printing press, and today few are the people who do not read, and most people read a great deal. . . . Considering the vast importance of reading and writing in modern life it is surprising that they have been so little investigated by physiologists and ophthalmologists. The forms of printed types are derived from manuscripts and have been modified for technical reasons. Further advance has been almost entirely empirical, and even in the best presses more care has been exercised in obtaining aesthetic effects than in fostering legibility. If we consider ordinary Roman printed characters, we find that all capital letters extend above the line. Of the small letters, thirteen are short, eight extend above the line (ascending letters), and four below the line (descending letters). There are thus twice as many ascending as descending letters, and in an ordinary

page of print it will be found that of the long letters, about 85 per cent are ascending and only 15 per cent descending. Examination of the short letters shows that their most characteristic features are in the upper parts. Hence, in reading, attention is specially directed to the upper parts of the letters, as is strikingly demonstrated by covering the lower parts of a line of print with a card. The print is almost as legible as if it were uncovered. If, however, the upper halves of the letters are covered, it is almost, if not quite, impossible to read the print.

"Legibility is not determined solely by visibility in the physiologic sense of the term. Thus the emphasis of some lines in letters increases legibility while diminishing visibility. . . . Reading is a highly complex act, and the rules which can at present be devised for the avoidance of strain and discomfort involve a multiplicity of factors which have not yet been satisfactorily correlated."

Eye Clinic in the Wilderness.—In an obscure village in northern India, serving Hindu and Mohammedan natives from the surrounding country and thousands of patients from outlying districts, a surgeon who, forty years ago, went to Baluchistan as a young medical missionary has awed visiting American army doctors by his technique in the treatment of eye cases under the most primitive conditions. Dr. Henry Tristram Holland, today Sir Henry Holland, is said to have performed more cataract operations than any other living man. American visitors saw registered 6,000 patients, upon whom 2,500 eye operations were performed, 1,200 of which were cataract extractions. The hospital facilities available to the hordes of sufferers reaching Shikarpur by train, cart, camel, and afoot consist of a small four-room building, equipped with operating rooms containing rough wooden tables. Instruments fashioned of brass by native artisans are sterilized in pans of alcohol, or of boiling water kept hot over kerosene stoves. Illumination for delicate surgery consists of a bare electric bulb held in position by an attendant. Post-operative patients have quarters in an open compound, canopied against rain. Because many have travelled long distances for medical attention, one relative is permitted to accompany and remain to nurse each patient. Dr. Holland's daily eye operations include every type of case, always with a high percentage of cataract extractions. Inadequate diet, long exposure to

glaring sunlight, and unhygienic living conditions produce an endless flow of native patients to his clinic door, approximately a tenth of whom must be turned away with a diagnosis of absolute glaucoma. "Observers from our shores, reporting on their field experiences, have received fresh inspiration for the belief that, if sound techniques are employed, 'field conditions' in handling a huge number of patients need not militate against highly favorable results," states a recent issue of *The Health Officer* (London).

Explosives Manufacturers Warn Against Blasting Caps.—The Institute of Makers of Explosives is appealing to school authorities to assist in its effort to prevent accidents resulting from the handling of blasting caps by children who do not realize their potential danger. Through the carelessness of workmen these detonators, which are used for firing high explosives, are sometimes left on the site of blasting and building activities, especially in rural and suburban areas in the spring and summer months. Ignited from a match, thrown into a fire, or struck with a stone, blasting caps may cause infinite damage and painful injury. Educators are requested to influence their classes not to touch such caps, but to report their discovery to an adult competent to dispose of them safely.

School Bus Drivers' Eyes.—The health officer for five counties in North Carolina has found that of the youths applying for permits to drive school buses in that state, one third have disqualifying visual defects. One North Carolina county last year examined its would-be drivers for the first time, with 28 out of 84 failing to pass. Of the 28 rejected, only one failed in but a single visual test; all the rest failed in two or more. Three applicants were found to be blind in one eye. The majority of failures were due to inability to effect quickly the transition from near to distance vision. These eye tests are designed to establish whether the applicants possess normal acuity and are capable of adequate functioning under such circumstances as normally obtain in driving a car. Some who failed were later checked by an ophthalmologist, who found still further defects in three out of five. The county grand jury has commended the local health department for inaugurating this safety measure, and authorizes similar tests for future applicants.

New Prevention of Blindness Quarterly.—In December, 1939, The District of Columbia Society for the Prevention of Blindness issued Volume I, No. 1, of their *Prevention of Blindness Quarterly*. The initial number proved to be an attractive little eight-page booklet, carefully prepared and containing a number of brief but provocative articles. One called attention to a summary of that Society's ophthalmia neonatorum study in five Washington hospitals during the years from 1933 to 1938. Acknowledgment was made of the gift of a talking book to a junior sight-saving class in the city. A brief discussion was presented on the paper, "What the Pediatrician Does to Save Sight," presented by Dr. Philip M. Stimson at the National Society's Annual Conference last October. There were a number of notes regarding activities of members of the District of Columbia Society's staff; a note welcoming inquiries addressed to the *Quarterly*; brief commendation of a leading article on handwork for partially-sighted children contained in November's *Sight-Saving Class Exchange*, and an expression of the season's greetings to its new readers.

Spare Seats in English and Scottish Blind Schools.—At conferences in Manchester and Edinburgh last year, speakers expressed their gratification over the decline in registrants at schools for blind children. Only two-thirds of the facilities available in Manchester were required, and in Scotland it was computed that the total enrollment of blind children had been similarly reduced in the past fifteen years.

Engineering Societies Discuss Light Allied to Safety.—In an address presented before a joint session of the New York Section of the Illuminating Engineering Society and the Metropolitan Chapter of the American Society of Safety Engineers, Mr. Howard M. Sharp, the general secretary of the former group, discussed the subject of light as an ally of the safety engineer. Remarking that while the wealth of available information relating to safety measures was enormous, losses through failure to abide by the known fundamentals are appallingly great, the speaker maintained that it is not even yet well understood what a significant part light can play in reducing accident tolls. It was suggested that engineers

think more of light in terms of people, and through them in terms of safety. It was stated that the public and its response to environment determines by its human reactions the results to be achieved by engineering. The engineer must therefore think more of his living subject in terms of human behavior, not as a mechanized unit the operation of which can be automatically controlled. Deploring the emphasis placed on charts and tables stipulating lighting minimums in terms of foot-candles, while overlooking fluctuating human elements which contribute to swell accident statistics—fatigue, inattention, false economies—the speaker said:

“Light affects the eye, and through that remarkable organ almost every emotional and physical activity of man. We can, therefore, construct the finest safeguards to life and limb only to find them reduced to a fraction of their theoretical efficiency because men can't see to use them. We know that fatigue is quite facetiously called ‘an accident looking for a place to happen,’ but do we recognize that improper lighting contributes to fatigue, and thus to accident potentialities? It is well established that from 20 to 40 per cent of human nervous energy is consumed daily in the act of seeing. Experiments have shown that muscle tension can be relaxed or tightened simply by varying the lighting . . . It is apparent that too much of the time we subject people to conditions that require them to call upon their reserve emergency capacities for the execution of what we choose to call normal conditions. Then, when the real emergency arises, the reserve has been drained and the response is insufficient . . .”

Proceeding to a consideration of traffic fatality figures and their import to safety and lighting engineers, Mr. Sharp pointed out that since 1930 daytime street accidents have decreased 5.4 per cent, while the same period has shown a 54.5 per cent increase in fatal road accidents at night, despite the fact that night traffic is equal to only one-quarter the daytime volume. “No matter from what angle we approach this fact, the evidence is the same—lack of visibility is the one great difference between daytime and nighttime driving. While we can never reproduce at night the lighting conditions of the day, we can vastly improve on the admittedly inadequate attempts made to date. The only solution known that has proven effective is fixed lighting, out of the control of highway

users, placed at or along a dangerous location. . . . The thinking is that light-colored roads cause glare and eyestrain during day-time driving, but the proponents forget that light roads at night are a tremendous aid to visibility, and that possibly the wearing of dark glasses during the day will reduce glare, but nothing we can do at night will change the dark surface to a light surface. Safety engineers should raise their voices in unmistakable terms when things like this are mentioned."

Eyesight Symposium.—A large portion of the September, 1939, issue of *The Journal of the Missouri State Medical Association* was devoted to the following articles, appearing under the heading, "Symposium on Conservation of Eyesight":

"Ophthalmia Neonatorum," Leslie C. Drews, M.D.

"Loss of Eyesight in Children Due to Refractive Errors and Crossed Eyes," Winfred L. Post, M.D.

"Congenital Syphilis and its Effect Upon Eyesight," Philip S. Luedde, M.D.

"Causes and Prevention of Blindness in Adults," John McLeod, M.D.

"Industrial Eye Injuries and Hazards, Their Prevention and Treatment," Roy E. Mason, M.D.

"Conservation of Eyesight," Clyde P. Dyer, M.D.

In his study of ophthalmia neonatorum, Dr. Drews states: "There is no other disease in which prophylaxis is so brilliantly effective and so gratifying If treatment is started reasonably early, almost all the eyes are saved."

In his discussion of children with crossed eyes, Dr. Post encourages parents of such patients to foster interest in games involving guessing distances and gauging depth, since these occupations demand that the eyes maintain parallelism. As for failure to urge wearing of the prescribed glasses at a sufficiently early age, he writes: "Do not think that children will lose spectacles or refuse to wear them . . . they like to see clearly just as much as anyone and will certainly set up a protest when the instrument of that vision is removed."

Dr. Luedde outlines the ocular conditions arising from congenital syphilis, and states in closing: "The point most to be stressed is

prophylaxis by complete examination of the pregnant woman and insistence upon serologic tests in all cases and, where tests are positive, early and prolonged arsenical and mercurial therapy in the prenatal period. In children in whom serologic tests reveal congenital syphilis, early and adequate antisyphilitic treatment will do much to prevent painful and destructive manifestations of the disease."

Dr. McLeod's study of the causes and prevention of blindness in adults is based upon a Pennsylvania survey of 11,852 cases and is general in its treatment. Dr. Mason emphasizes in his paper on industrial eye hazards and their prevention the acuteness of mental and economic suffering which can result from an accident involving loss of vision at a time of life when earning power is thereby greatly curtailed. He urges hospitalization of workmen suffering a penetrating eye wound, and careful note-taking in each case of eye injury. Damage by chemical substances and burns from arc welding are also discussed, and a closing plea is made for insistence by safety engineers on the employment of every known safety device calculated to minimize eye accidents.

Malingering as Observed by a Military Eye Surgeon.—It is important that a patient suspected of ophthalmic malingering be tested, after study of the history and documents, without intimation of doubt on the part of the examiner. Significant and simple procedures which may be employed to determine visual acuity in either or both eyes are described by Sydney Tibbles, L.R.C.P., L.R.C.S. Ed., in an article in the *British Medical Journal*. He remarks that healthy pupils contract uniformly in the light of a small torch. Nearsighted subjects commonly have larger than normal pupils, while older patients have relatively smaller pupils than young ones. A patient claiming blindness in one eye may be asked to read small print held a foot away, and to repeat the reading with a ruler held a few inches from his eyes. If he reads readily the second time, it is because he is using both eyes. A strong prism may be held base up or down before the bad eye while the subject is instructed to pick up and write with a pen placed before him. Attempting this with both eyes open, if difficulty is experienced in grasping and using the pen, the patient sees with both eyes and the

objects appear to be some inches apart. Reading alternate red and green test letters through a red and a green lens which screen out letters of the same colors will reveal sight in both eyes if all letters can be identified.

Reviewing thousands of eye examinations conducted at recruiting headquarters during the last war, the writer recalls many malingerers, some of whom produced certificates attesting to various eye conditions, a large number of whom had artificial conjunctivitis induced by wilful use of irritants. In contrast were volunteers with genuinely acute eye problems, who sought ophthalmic surgery to enable them to meet service requirements. In another group were instances of psychological conflicts producing temporary blindness due to hysteria. It is remarked that at present the men examined, in their desire to be accepted, minimize any slight refractive errors found, and that evasions are relatively few.

Chemistry Shows Why We See Colors.—An initial paper on the chemical analysis of color vision in animals has been presented by a member of Harvard University Biological Laboratories. Dr. George Wald has isolated, in the cones of chickens' eyes, three pigments which he believes act as color filters: astacene, which is present in the scarlet of the lobster when boiled; xanthopyll, an egg-yolk yellow; and carotene. A violet-colored pigment which has been named iodopsin, thought to be the first light-sensitive pigment ever located in the cones of the eye, is present in the "film" on which the filtered light first falls in the seeing process. On the basis of these findings it is believed that many of the phenomena of seeing colors may ultimately be explained in terms of relatively simple chemical and physical reactions taking place in the eye itself. Many of the properties of vision are derived directly from the properties of substances located in the retina. Direct chemical analysis of retinas has proved the presence in the rods of a rose-colored pigment, rhodopsin, which is sensitive to light and which is manufactured in the body, presumably from vitamin A or retinene. This discovery promises to bridge a gap in our comprehension of the chemical relationship of vitamin A deficiency to night blindness.

Darkness Blankets Industry Abroad.—A multitude of problems have necessarily followed in the train of war developments in Europe, and the adjustment of industrial routine, personnel, and equipment to emergency requirements is engaging the thoughts of many in British industry. Not only must new workers be trained to fill the ranks thinned by military service, and work schedules rearranged to maintain production, but exact observance of safety precautions is imperative. Factories operating during hours of winter darkness are studying the Emergency Powers (Defence) Restrictions on Lighting, which specify:

“Subject as hereinafter provided, no person shall during the hours of darkness cause or permit any light inside any roofed building, closed vehicle or other covered enclosure to be displayed unless the light is so obscured as to prevent any illumination therefrom being visible from outside the building, vehicle or enclosure.”

After making every possible effort to obtain as much daylight and as efficient artificial illumination as possible, industry now is faced with the urgent necessity for blacking out huge expanses of windowed outer walls and factory roofs—at least to a degree satisfactory for rendering certain areas virtually invisible in the event of night attack from the air. Painting glass areas black, though a comparatively inexpensive means of complying with regulations, creates more or less permanent blocking of natural light through the same areas by day and increases the degree of glare indoors under artificial illumination, without adding extra protection against shattering in an emergency. Moreover, the smashing of even one unprotected window during operation in darkness would necessitate suspending work until the light hours of the following day, or immediate recourse to substitute measures. Thus opaque shutters and blinds, easy to adjust and designed to withstand the impact of flying objects, are regarded with great favor, provided it can be demonstrated that no light escapes during the blackout periods. In many cases, present circumstances demand that artificial lighting now be employed day and night in factory interiors. Except where management installs or has already equipped plants with efficient lighting units, employees accustomed to cheerful and bright work surroundings find themselves struggling to maintain efficiency

and optimism under dismal disadvantages. At the same time the entire populace is required to comply with stringent demands for widespread economy of supplies and, while these measures do not primarily apply to the employment of public utilities in the manufacture of necessities, extravagant use of power is condemned.

A temporary rise in industrial accidents seems inevitable, due to the acquisition of new and untrained help. However, steps are being taken to minimize dangers arising from inability to see safely in darkness after abandoning a well-lighted area. Men leaving plants to go into a completely darkened outside world, after hours under artificial light rendered more glaring by the very black-out equipment demanded for protection of property and the public, are safest after dismissal from their shift if the light intensity is gradually reduced toward the factory exits, or if workers are briefly detained in a "light trap" before leaving the factory premises.

It is to be noted that the Industrial Welfare Society of Great Britain is concerning itself with these war-time problems, acting voluntarily to speed up production, improve the conditions of workers, and simplify industrial dilemmas presented for consideration by co-operating groups. In the October, 1939, issue of *Industrial Welfare and Personnel Management*, its own publication, the Society offers, among subjects now under discussion on which assistance is available, the following:

LIGHTING: Black-out restrictions, which in many cases involved the most rapid rather than the most suitable measures, have brought serious problems in their train, not only for night workers, but, with the shortening hours of daylight, for day workers also. For example, in many cases skylights have had to be permanently darkened so that employees must work by artificial light. This involves the danger of injury to eyesight, increased fatigue and loss of output unless precautions are taken, and it may be necessary to rely more upon individual than upon general lighting. This is a subject the Society is investigating in conjunction with the organizations concerned with lighting.

John H. Finley, 1863-1940.—Workers for the blind, as well as those in the field of prevention, mourn the loss of Dr. John H. Finley, whose participation in both these fields was of incalculable value. The Executive Committee of the National Society for the Prevention of Blindness passed the following resolution in Dr. Finley's honor:

"In the death of Dr. John H. Finley, the movement for the prevention of blindness and the conservation of vision lost one of its most understanding and most effective advocates. Becoming a charter member in 1915 of the New York State Committee for the Prevention of Blindness, Dr. Finley maintained this connection until the Committee's dissolution, when he accepted appointment as an Honorary Vice-President of the national organization. Not only did he take an active personal interest in the campaign to protect eyesight, but his scholarly and inspiring editorials on this subject were read by thousands in the *New York Times*, the newspaper which he served for many years as editor and later as editor emeritus.

"Dr. Finley displayed early in life those qualities of character, intellect, and love of his fellow men which brought him a rich life, international recognition, and the affection of all who knew him. The National Society for the Prevention of Blindness expresses its appreciation of his stimulating leadership, and records with sorrow the loss of this valued associate."

J. Howard Fell, 1880-1940.—In the death of Mr. J. Howard Fell, of William F. Fell Company, printers, the Society has lost a faithful friend and counsellor, as well as business associate. For many years Mr. Fell was the personal representative of his company, who gave his time and the benefit of his technical knowledge to help the Society present its printed material—especially as to visibility of type, selection of paper, and attractiveness of make-up. In the printing of the Society's publications, Mr. Fell built a monument which perpetuates his memory.

Current Article of Interest

The Prophylaxis of Ophthalmia Neonatorum with Silver Acetate, William F. Hartman, M.D. *The Pennsylvania Medical Journal*, February, 1940, published monthly by the Medical Society of the State of Pennsylvania, 230 State Street, Harrisburg, Pennsylvania. As indicated by the title, Dr. Hartman confines the present discussion exclusively to prophylaxis with one per cent silver acetate for cases of ophthalmia neonatorum in the newborn resulting from gonorrheal infection, and contrasts the results with those secured through employment of the classic silver nitrate technique. The arguments are presented that, in spite of the prestige attaching to the Credé method, gonorrheal ophthalmia still occurs; that one per cent silver nitrate solution causes a considerable incidence of conjunctival irritation; and that mistaken use of a silver nitrate solution stronger than one per cent might sometimes occur. Case records are cited, indicating the limitations and the traumatic potentialities of silver nitrate. Advantages of silver acetate are its low solubility (one per cent brings a solution to saturation, making overdosing impossible); and its formation of double silver compound and acetic acid when broken down—a much less irritating combination than that of the double salt and nitric acid formed by silver nitrate.

The author states that the Philadelphia Lying-In Hospital and Maternity Department of the Pennsylvania Hospital, by permission of the Pennsylvania Department of Health, has adopted the use of a fresh one per cent solution of silver acetate as prophylaxis for the eyes of newborn babies. One drop is instilled in each eye immediately after birth. Comparative figures are quoted which reveal the incidence (0.20 per cent) of ophthalmia neonatorum occurring in five Philadelphia hospitals allegedly employing the Credé technique stipulated by law, contrasted with a tabulation of results obtained by use of a one per cent silver acetate solution (0.09 per cent). The few cases represented by the latter figure all occurred immediately following the institution of the new procedure. Studies are now in process comparing the amount of chemical conjunctivitis resulting from the use of these two solutions.

Book Reviews

HYDROPTHALMIA OR CONGENITAL GLAUCOMA, Its Causes, Treatment, and Cure. J. Ringland Anderson. Foreword by Sir John Herbert Parsons. Cambridge: Published for the *British Journal of Ophthalmology* by the Cambridge University Press. New York: The Macmillan Company, 1939. 377 p. ill.

This book is the presentation of a single subject of a specialty in medicine. It is naturally, therefore, of primary importance to the ophthalmologist. Those, however, who are interested in the prevention of blindness will find it of value, if they are not at once submerged by a flood of Greek roots and derivatives.

When they have learned that "hydrophthalmia" is simply dropsy of the eye due to a stretching of the eyeball in early life or before birth until it has lost its normal form, and that "buphthalmos" or "ox eye" is due to an expansion of the front of the eyeball and is not compatible with fairly good sight, they are ready to begin with the glossary and will not find the subject so obscure as they had feared.

The last previous monograph written on infantile glaucoma that had any claim to completeness was by Dr. Emund L. Gros and was published forty-three years ago. It was entitled "*Étude sur l'Hydrophthalmie ou Glaucome Infantile*," and Sir John Parsons says, "It was an excellent résumé of our knowledge up to that date." Dr. Gros was not an eye specialist, but he later became the very distinguished head of the American Hospital in Paris. It is quite understandable why any pathologist should be interested in this malformation because it is so frequently associated with other involvements of the neurovascular and of the bony systems. Among the most common defects associated with infantile glaucoma are neurofibromata, hemangiomas, facial naevi, retinal detachments, and other evidences of structural maldevelopment.

In the first chapter the author makes an important distinction in the nomenclature employed. "Of the many different names given in the past to the condition under discussion, 'hydrophthalmia' and 'buphthalmia' have been most widely used. A. Fuchs (1926) reserved the term 'buphthalmos' for the condition in which

an anterior staphyloma arises in infancy, and 'hydrophthalmos' for 'primary infantile (congenital) glaucoma.' . . . The eye of the bull does not suggest the failing vision or the raised tension which are essential features In this work we use only the terms 'congenital glaucoma' and 'hydrophthalmia,' which will be considered as synonymous."

The hopelessness of accomplishing anything in a beneficial way for this condition is outlined in a conversation supposed to be held between the surgeon and the father of a young patient who for this defect had received a trephine operation a year before. The father inquires whether the boy would have had a better chance without the treatment. The surgeon answers, "I do not know." The father inquires further, "Do any untreated patients with this disease retain sufficient vision to enable them to earn their living for a few years?" The surgeon again says, "I do not know." The father asks once more, "If he marries, will his children be affected?" Again the surgeon answers, "I do not know." This agnostic attitude is probably for the purpose of discouraging too hopeful a view in regard to infantile hydrophthalmos, but it does not seem wholly warranted. Deductions may indeed be drawn in regard to individual cases. In the experience of the reviewer, a little girl of ten years, with infantile glaucoma which resulted in absolute blindness, suffered from such intense pain that enucleation of both bulbi became imperative. Forty years later a younger brother developed evidences of glaucoma. Today he is absolutely blind. May it not be fairly assumed that the "anlage" in the embryonic formation in the one case was so structurally defective that it was impossible for nature to elaborate a functioning organ from it? As the natural changes of presbyopia developed in the brother, that same limited structural stability manifested itself, though at a later period, and the consequence was, in the first instance, an unfinished and imperfect organ, deformed and unsightly, quite unfitted for the function of seeing; in the other, a limited structural life which reached its conclusion at an earlier period than in those who were more fortunate in their inheritance. In other words, the cyto-architectural plan in the one case went all wrong; in the other it was carried out for a limited time but then, not being basically sound, the tissues gave away under normal intraocular pressure.

The book which Dr. Anderson has given is full of important facts which make it of great value as a storehouse to be drawn upon. As the result of a questionnaire sent out to oculists generally, information was collected concerning 205 eyes of 116 patients. Eight hundred seventy-four forms were sent to 346 oculists living in 32 different countries, so that the conclusions aggregated may be considered to be fairly representative of the experience of ophthalmologists throughout the world. Happily, infantile glaucoma is a rare affliction. Among large numbers of patients, it occurs only once in many thousands of cases. According to Wright, who has seen a disproportionately large number of cases, many of these eyes are only moderately affected and they may function for many years. One is led to question, however, whether some of these simpler cases may not have been due to megalocornea, or enlargement of the front of the eyeball in which vision may, indeed, persist for years. India, it will be recalled, is the home of keratomalacia or softening of the cornea, which is due to malnutrition and which may be controlled by proper feeding, while infantile glaucoma is congenital and due to inherited defects. While the diagnosis, the course, the incidence, and the treatment of these conditions are quite different, the seeming resemblance in the enlargement of the eyeball has led to a confusion of terms in many clinics where they are employed interchangeably. Wright does not make this distinction as, in a recent article on glaucoma (*American Journal of Ophthalmology*, June, 1937), he says: "In my experience it is more difficult to establish effective leakage in hydrophthalmic or buphthalmic eyes than in other types of glaucoma." Buphthalmic eyes may become glaucomatous, but they have not primarily increased tension. The author has therefore done well in limiting the designation of the terms "hydrophthalmia" and "infantile glaucoma" to the congenital, which is a distinctive form of enlargement. The term "buphthalmos" should not be relinquished, as it describes a pathological condition that may not properly be excluded.

The author's studies in comparative anatomy are both interesting and instructive. He has had an opportunity of studying the histology of unusual forms of Australian life. These include a variety of the marsupials, among which are the native cat (*Dasyruis viverrinus*), the ringtailed phalanger (*Pseudochirus*), the longtailed

an anterior staphyloma arises in infancy, and 'hydrophthalmos' for 'primary infantile (congenital) glaucoma.' . . . The eye of the bull does not suggest the failing vision or the raised tension which are essential features . . . In this work we use only the terms 'congenital glaucoma' and 'hydrophthalmia,' which will be considered as synonymous."

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phalanger (*Trichosurus*), the wombat (*Phascolomys*), and the gray kangaroo (*Macropus giganteus*). In many sections the ringtailed phalanger revealed a much cruder structure, and the native cat a more advanced one. Probably this is because the visual requirements of these creatures are quite different, some depending on their sense of smell more than on that of sight. In many sections, dense iris processes were found which separated the sinus from the angle. This is well marked in the wallaby (*Thylogale*), and is almost like a spur. The anatomic difference may have an ontogenic value in the construction of Schlemm's canal. These studies may be helpful in showing that in the development of the human eye, had the building blocks been sound and rightly placed, the ultimate structure would under stress prove more resistant.

Although it is not a happy piece of work to produce a volume that carries with it so little reason for hopefulness from operative or other procedures, the subject of operation is well considered and the different operations evaluated together with the results that might ultimately be looked for. No mention is made of Otto Barkan's new operative procedure, although this would seem to be one for which it might be applied. If, however, the degenerative changes are due to defective structure rather than a closure of Schlemm's canal, it is quite understandable why no operative measure can be successful.

Some cases of glaucoma in children are obviously due to certain malformations, of which the most common are aniridia and microphthalmia. "In aniridia, glaucoma is undoubtedly often caused by the union of the iris root and the posterior surface of the cornea. In microphthalmia, the narrowness of the circumlental space plays a part. As the finer changes which may hinder the function of the drainage channels are beyond our knowledge at present, our conceptions are largely hypothetical."

We obtain in this book the combined opinions of many skilled observers, and intelligent conclusions may be anticipated. The general reflections in the concluding chapter are thoughtful and judicious. Every surgeon will find the book a valuable addition to his library. The volume is printed on good paper but heavily leaded, which makes it somewhat inconvenient to handle. Extensive tables are placed in a pocket attached to the cover which add

to its value as a work of reference. The illustrations in black and white are very good.

—PARK LEWIS, M.D.

A MANUAL OF PRACTICAL ORTHOPTICS. G. H. Giles. London: The Hatton Press, 1938.

It is somewhat surprising that this book should have come out of England. It is largely a consideration of orthoptic apparatus and its applications, and in the discussion a major emphasis is laid upon the continental contributions (Cantonnet wrote the foreword), whereas the British Orthoptic Council and English authors of publications dealing with orthoptics usually have given the French instruments and the "mental effort" technic but scant attention.

Orthoptics in America largely follows the English pattern so that only occasionally do we see the separator, the diploscope, and the Pigeon-Cantonnet stereoscope used here.

Similarly little attention is paid by the author to careful refraction under atropine and the use of continued atropinization as adjuvants to orthoptic training. The point of view is largely what would be characterized as the optometric point of view in America.

The most serious divergence of opinion between the author and other teachers of orthoptics in England and America relates to abnormal retinal correspondence. The writer claims not to have found many cases in practice. Most other writers in this field are finding the condition more frequently as their experience and technical refinements grow, so that in many quarters it is believed that it can be demonstrated in almost every squinter of any considerable duration. I believe this is largely a matter of careful technic and that it would be quite impossible to demonstrate abnormal retinal correspondence on many provable cases if the only tests utilized were those made on the Cantonnet stereoscope. Even in using the major amblyoscopes the author does not, apparently, utilize those refinements in technic which the English school of orthoptics stresses emphatically, and he commits the unforgivable sin of permitting patients with anomalous correspondence to undertake home training. True, he states that "great care must be taken in home training that some false area is not being stimulated" (p. 74), but who is to take this care? It is very like urging them to eat

plenty of mushrooms but not the poison kind. Considerable technical knowledge is sometimes required to differentiate.

This Manual of Practical Orthoptics should be read by those interested in orthoptics primarily for the value it has as an Englishman's presentation of a French point of view. It very definitely should not be used as a teaching guide in training orthoptic technicians.

—LEGRAND H. HARDY, M.D.

Briefer Comments

SAFE DRIVING. J. R. Hamilton and L. L. Thurstone, M.E.Ph.C. New York: Doubleday, Doran & Company, Inc., 1937. 74 p.

This collaboration of a scientist and an advertising man presents a twofold view of the basic human limitations involved in automobile driving. Throughout the several chapters on Highway Driving, Traffic-Lane Driving, and Night Driving, Dr. Thurstone's scientific text is presented jointly with Mr. Hamilton's discussion, in simple lay terms comprehensible to every driver, of the same subjects. The basic material is confined solely to the definite human limitations affecting all motorists, and is predicated on analyses of accident causes resulting from an independent study conducted at the University of Chicago. Visual concentration in relation to speed; the effect of increased speed on the focal point; foreground and peripheral vision; perception of space and movement; and scotopic or night vision, are among the topics ably covered by one or both of the authors. The presentations of each are uniformly excellent, as are the simple diagrams and graphic camera studies selected as illustrations.

Books Received

DIRECTORY OF SOCIAL AGENCIES OF THE CITY OF NEW YORK, 1940. Anastasia H. Evans, Editor. New York: Columbia University Press, Publisher, 1939. 484 p.

PROCEEDINGS OF THE NATIONAL CONFERENCE OF SOCIAL WORK at the Sixty-Fifth Annual Session, Seattle, Washington, June 26-July 2, 1938. Chicago: The University of Chicago Press, for the National Conference of Social Work, 1939. 802 pp.

- PRIMER OF ALLERGY, Warren T. Vaughan, M.D. St. Louis: The C. V. Mosby Company, 1939. 140 p. ill.
- SAFETY PROGRAMS AND ACTIVITIES for Elementary and Junior High Schools, Florence Slown Hyde and Ruth Clara Slown. Chicago: Beckley-Cardy Company, 1939. 269 p. ill.
- THE BASIC MECHANICS OF HUMAN VISION, R. Brooks Simpkins. Cleveland: The Sherwood Press, 1939. 228 p. ill.
- PAPERS ON SOCIAL HYGIENE. New York Regional Conference on Social Hygiene, 1939. New York: New York Tuberculosis and Health Association, 1939. 127 p.
- BRITISH STANDARD SPECIFICATION FOR SAFETY GLASS FOR LAND TRANSPORT, British Standards Institution, No. 857, 1939. London: The British Standards Institution, 1939. 30 pp.
- THE 1939 YEAR BOOK OF EYE, EAR, NOSE and THROAT, edited by E. V. L. Brown, M.D., Louis Bothman, M.D., and Samuel J. Crowe, M.D. Chicago: The Year Book Publishers, Inc., 1939. 656 pp. ill.
- HEALTH OFFICERS' MANUAL, J. C. Geiger, M.D. Philadelphia: W. B. Saunders Co., 1939. 148 pp. ill.
- APPLIED ORTHOPTICS, S. Edwin Rudlin, B.A., O.D. Richmond, Virginia: The Dietz Press, 1939. 195 pp. ill.
- TRANSACTIONS OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY, Seventy-Fifth Annual Meeting, Hot Springs, Virginia, 1939. Philadelphia: American Ophthalmological Society, 1939. 467 pp. ill.
- THEORY AND PRACTICE OF ANALYTICAL REFRACTION AND ORTHOPTICS, Israel Dvorine, O.D., F.A.A.O. Baltimore: The Waverly Press, 1939.
- YOUR COMMUNITY—Its Provision for Health, Education, Safety, Welfare, Joanna C. Colcord. New York: Russell Sage Foundation, 1939. 249 p.

Current Publications on Sight Conservation

Note.—The National Society for the Prevention of Blindness presents the most recent additions to its stock of publications. Except for the more expensive ones, single copies are sent free upon request. Unless otherwise specified, they are reprinted from *THE SIGHT-SAVING REVIEW*. New publications will be announced quarterly.

319. Guidance Material for Preparing Partially-Sighted Children for Effective Living, Margaret Soares. 12 p. 10 cts. Lists vocational guidance material helpful in planning favorable social and economic development of sight-saving class children. Reprinted from *The Sight-Saving Class Exchange*, February, 1940.

320. Leisure Time Activities for Partially-Seeing Children, Eva K. McCauley. 12 p. 10 cts. A study of the technique of developing in sight-saving class pupils habits, skills, interests, and appreciations suitable to their aims and abilities. Reprinted from *The Sight-Saving Class Exchange*, February, 1940.

321. Study of Vocations for the Partially Seeing, Elizabeth Hansen. 8 p. 5 cts. Suggests a sight-saving class study of possible occupations, listing agencies distributing vocational information. Reprints from *The Sight-Saving Class Exchange*, February, 1940.

322. Optimum Working Conditions for the Eye, C. E. Ferree, Ph.D., and G. Rand, Ph.D. 12 p. 10 cts. Recapitulation of conclusions after twenty-five years of research in the field of lighting and the eye.

323. Incidence and Distribution of Trachoma in the United States, Harry S. Gradle, M.D. 8 p. 5 cts. Racial and geographical distribution of the 60,000 trachomatous population.

324. The Ophthalmologist and the Sight-Saving Class Teacher in Conservation of Vision, Edmond L. Cooper, M.D. 12 p. 10 cts. Defines interrelationships of mutual problems of sight conservation in relation to sight-saving classes.

325. The Part the Doctor Can Play in the Prevention of Blindness, J. V. Cassady, M.D. 12 p. 10 cts. Discusses possibilities for conservation of vision committees of state medical societies.

326. What State Supervising Ophthalmologists are Doing in the Prevention of Blindness, V. M. Hicks, M.D. 8 p. 5 cts. Describes major problems related to local conditions in South Carolina.

327. Personal and Group Responsibility in Prevention of Blindness, C. E. Rice, M.D. 8 p. 5 cts. Appeal for acknowledgment of responsibility among citizens, parents, physicians and sight conservation agencies.

328. Relation of Eye Dominance and Prediction of Failure to Learn to Read, Marie W. Koblish. 8 p. 5 cts. Study of significant factors in reading disability as related to eyedness. Reprinted from *The Sight-Saving Class Exchange*, April, 1940.

329. Prevention of Reading Difficulties, Erma G. Grill. 12 p. 10 cts. Survey of elements predisposing children to reading disability, with suggestions for a prevention program. Reprinted from *The Sight-Saving Class Exchange*, April, 1940.

D129. The Nurse in an Eye Health Program, Pearl McIver, R.N. 4 p. (\$1.00 per C; \$7.50 per M.) Discusses interdependence of eye health and general nutrition, emphasizing the function of public health nurses in prevention of blindness. A paper from the nursing education session of the Society's Annual Conference, 1939. Reprinted from *Public Health Nursing*, January, 1940.

D130. Teaching Eye Health to Student Nurses in Hospitals With and Without Eye Departments: 1. In a Hospital Having an Eye Department, Cora L. Shaw, R.N.; **2. In a Hospital Having No Eye De-**

partment, Hedwig Toelle, R.N. 16 p. 10 cts. Papers presented during the nursing education session of the Society's 1939 Annual Conference. Reprinted from *The American Journal of Nursing*, February, 1940.

D131. Third Annual Summary of Fourth of July Injuries (1939). 8 p. (\$1.75 per C; \$14.50 per M.) The 1939 review by the American Medical Association of Fourth of July injuries reported in the United States. Reprinted from the *Journal of the American Medical Association*, January 6, 1940.

D132. A Program for Staff Education: Eye Health, Eleanor W. Mumford, R.N. A study outline of important aspects of eye health, stressing the desirability of integration with related health problems and programs. 16 p. 10 cts. Reprinted from *Public Health Nursing*, February, March, 1940.

D133. Nutrition as It Relates to the Eye, Arthur M. Yudkin, M.D. 8 p. 5 cts. Discussion of eye health in relation to diet deficiencies and faulty nutrition. A paper presented at the nursing education session of the Society's Annual Conference, 1939. Reprinted from *Public Health Nursing*, April, 1940.

Contributors to This Issue

Drs. Ferree and Rand of Baltimore are widely known to sight-saving groups for their outstanding scientific researches on the subject of lighting and the eyes. **THE SIGHT-SAVING REVIEW** welcomes this opportunity to publish their summary of conclusions drawn from a quarter-century of study.

Dr. Harry S. Gradle, a frequent contributor to our pages, is consulting ophthalmologist of the Indian Medical Service, and attending ophthalmic surgeon of the Michael Reese Hospital, Chicago.

A newcomer among **REVIEW** authors, **Dr. Edmond L. Cooper** is a practising ophthalmologist of Detroit, and a lecturer during the advanced sight-saving courses conducted in the summer of 1939 at Wayne University.

The survey presented in this issue of possibilities for service through state vision conservation committees was prepared by **Dr. J. V. Cassady**, ophthalmologist of South Bend, and chairman, committee on conservation of vision, of the Indiana State Medical Society.

Dr. V. M. Hicks, state supervising ophthalmologist of the Aid to the Blind Program, of Raleigh, North Carolina, writes with authority on this phase of the blindness prevention program.

An eloquent appeal for assumption of individual responsibility in sight conservation is voiced by **Dr. C. E. Rice**, consultant on blindness, Bureau of Public Assistance of the Social Security Board, Washington, D. C.